# Bulletin: General Catalog Issue 2021-2022 

Portland State University

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## PORTLAND STATE UNIVERSITY 2021-2022 BULLETIN



## 2021-2022 Bulletin

Information in this Bulletin is accurate as of June, 2021. It has been compiled with care but may contain errors. Any errors discovered should be reported to the Office of Academic Affairs.
The Portland State University Bulletin is not a contract but rather a guide for the convenienceofstudents. The University reserves theright to change or withdraw courses; to change the fees, rules, and calendar for admis sion, regis tration, instruction, and graduation; and to change other regulations affecting the student body, at any time.
Portland State University supports equalopportunity in admis sions, education, employment, housing, and use offacilities by prohibiting discrimination in those areas based on age, color, disability, marital status, national origin, race, religion or creed, sex or gender, gender identity orgender expres sion, sexual orientation, veteran status, or any other basis in law. This policy implements state and federal laws. Inquiries about it should be directed to the Office of Equity and Compliance, 1600 SW 4th Avenue, Suite 830,Portland, OR 97201, 503-725-5919, or via email to equityandcompliance@pdx.edu;TTY: 503-725-6504.
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

|  | $\begin{aligned} & \text { FALL } \\ & 2021 \end{aligned}$ | $\begin{aligned} & \text { WINTER } \\ & 2022 \end{aligned}$ | $\begin{aligned} & \text { SPRING } \\ & \text { Sons } \end{aligned}$ | $\begin{aligned} & \text { SUMMER } \\ & 2022 \end{aligned}$ | $\begin{aligned} & \text { FALL } \\ & 2022 \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| ${ }^{1}$ Priority registration begins | May 10 | Nov. 8, 2021 | Feb. 14 | May 2 | May 9 |
| Classes begin | Sept. 27 | Jan. 3 | March 28 | June 20 | Sept. 26 |
| Last day to enroll in classes, add a class, or make section changes | Oct. 8 | Jan. 14 | April 8 | varies | Oct. 7 |
| Last day to drop without course recordedas W | Oct. 10 | Jan. 16 | April 10 | varies | Oct. 9 |
| Last day of refund period | Oct. 24 | Jan. 30 | April 24 | varies | Oct. 23 |
| Last day to make changes in grading option | Nov. 14 | Feb. 20 | May 15 | varies | Nov. 13 |
| Last day to withdraw from a class | Nov. 14 | Feb. 20 | May 15 | varies | Nov. 13 |
| Final examinations | Dec.6-11 | March 14-19 | June 6-11 | varies | Dec.5-10 |
| Term ends | Dec. 11 | March 19 | June 11 | varies | Dec. 10 |
| ${ }^{2}$ Commencement |  |  | June (dates <br> vary by college) |  |  |
| Holidays | Nov. 11 <br> Nov. 25- <br> 26 | Jan. 17 | May 30 | July 4Sept. 5 | Nov. 11 <br> Nov. 24 25 |

## Vision, Mission and Values

 Welcome to Portland State UniversityOur 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 vibranturban region through our creativity, collective knowledge and expertise.
- We are dedicated to collaborative learning, innovative research, community engagement, and career preparation.
- We educate a diverse community oflifelong 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 engagement, combining academic rigor in the classroomwith community-based learning.

Students from within 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 rank PSU among the "most innovative" universities in the nation for the last several years.

Distinguished programs and faculty.
Many of Portland State's disciplinary 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, interd isciplinary learning, andengagement in realworld problems, has established Portland State as a national model forother 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 their knowledge, 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 serve the city," inspires faculty research. Many professors research some of society's greatest challenges - providing students with firs thand 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 res earch.

The Portland State campus itself is a model for sustainability; eachnew 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 the classroom, engaging directly with the community and businesses to solvereal-world problems and achieve further 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 issues 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, making vital contributions in research areas ranging from the development of new treatments for dis eases to blockchain technology to discovering life beyond Earth. Our research strengths in specialized fields such as early childhood learning and biochemis try attract world-class
partners like the Howard Hughes Medical Institute. And programs like the PSU Co-Op and Build EXITO provide students access to cutting-edge research as well as training and professional development opportunities.

Researchers at PSU work across disciplines and partner with industry, governmentagencies, nonprofit organizations, and other universities to address thecritical challenges of the 21st century and improve life in Oregon, the nation, and the world. We collaborate with Oregon Health and Science University through the OHSU-PSU School of Public Health and interdisciplinary research where our expertise in data analysis, social science, biology, and chemistry add value to OHSU's clinical studies. Our University Research Centers work to improve urban life by using "smart city" technologies, exploring solutions to complex is sues such as homelessness, 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-divis ion coursework. Vanport Extension Center(VEC), named for its location between Portland and Vancouver, was situated in Vanport City, a wartime housing project that promised resident and clas srooms pace 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 MemorialDay 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 leg is lature created Portland State College 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

## Accreditation

Univers ity 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 small extension center to become a four-year, degree-granting college. Today this legacy inspires 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;
- JosephC. 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;
- W im Wiewel, 2008 to 2017;
- Rahmat Shoureshi, 2017 to 2019; and
- Stephen Percy, (interim president 2019 to 2020) appointed president 2020-present.
${ }^{1}$ From Creating Portland State: 1946-1955.
Portland State University is accredited by theNorthwest Commission on Colleges and Universities.
Accreditation of an institution of higher education by the Northwest Commission on Colleges and Universities indicates that it meets or exceeds criteria for the assessment of institutional quality evaluated through a peer review process. An accredited college or university is one which has available the necessary resources to achieve its 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 Northwest Commission on Colleges and Universities is notpartial butapplies to theinstitution
as a whole. As such, it is not a guarantee of every course or programoffered, or the competence of individual graduates. Rather, it provides reasonable as surance about the quality of opportunities available to students who attend the institution.

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

> Northwest Commis sion on College and Universities 8060 165th Avenue N.E., Suite 100
> Redmond, W A 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 ofChemistry is accredited by the American Chemical Society (ACS).

In the College of the Arts; theSchool 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 ofSchools of Theater(NAST). The Master of Architecture degree in the School of Architecture is accredited by theNational Architectural Accrediting Board (NAAB).

In the College of Urban and Public Affairs; theMaster of Urban and Regional Planning degree is accredited by the Planning Accreditation Board (PAB). The Master ofPublic Administration degree is 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 Administration (NASPAA).

In the College of Education; teacher 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 Commis sion of the Accreditation Board for Engineering and Technology (ABET). The computer science program is
accredited by the Computing Accreditation Commis sion of the Accreditation Board for Engineering and Technology (ABET). ABET can be contacted at 111 Market Place, Suite 1050, Baltimore, MD 21202-4012 - telephone: (410) 347-7700.

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

In the School of Public Health; the undergraduate programs in Applied Health and Fitness, 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 the bachelor's and the master's programs are accredited by the Council on Social W ork 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. To ensure consideration for admission, students should submit their application by the establis hed deadline for their intended start termand submit the nonrefundable \$52 application fee (fees subject to change without notice) when applicable. The application and nonrefundable \$52 fee are valid for three terms from the first admissionterm.

## 2. Admission validation.

To validate admis sion, the student must register for classes and enrollduring their intended termofadmission as selected on their application. If the student does not register and enroll for their first term, the application may be updated to one of the next three consecutiveterms without repaying the application fee; applicants will not be updated automatically. After this update period, applicants must submit a new application along with another \$52 application fee.

## 3. Official transcripts.

Transcripts must be submitted directly by each high school or college attended. Transfers tudents who haveearned fewer than 30 quarter credits of transferable college coursework are also required to submit official high school transcripts. In addition, all applicants who graduated from an Oregon high school in 1997 or after will be required to submit a high school transcript to validate their Second Languagegraduation requirement if it was met in high school.

To be considered "official," transcripts must be received by PSU in the sealed (unopened) original envelope or through approved electronic means fromthe issuing school. Since all official transcripts submitted become the property ofPSU and cannot be copied, returned to the student, or shared with other institutions, students are encouraged to obtain unofficial copies of their transcripts from prior institutions for advis ing 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 curriculumwill 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 SchoolCode is 4610

ACT SchoolCode is 3492

## Important: Altered transcripts and falsified applications.

Students who knowingly submit altered transcripts or falsified applications jeopardize theiradmission status and may have their admis sion rescinded and/or their registration 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.
All records submitted, filed, and accumulated in the Office of Admissions become the property of the University. The number of students admitted for any term is subject to the availability of space. When space is limited, selection may be based on grade point average, date of application, intendedmajor, 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 from a standard or regionally accredited high s chool may meet entry requirements through alternative testing. Alternative testing includes successful completion of one of the following:- Test of General Education Development (GED):
- If you took the GED after January 1, 2014: earn an overall average score of 170 and a minimum score of 150 on each subject test
- 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 anda $4 / 6$ 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 es say.

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 $A C T ®$. In addition to successfully meeting the criteria outlined for the SAT or the ACT®, students must also earn a minimum score of 470 or above ( 940 total) on two College Board SAT Subject Tests (Math LevelI or IIc, and one additional subject test of the student's choice). An examination in a second language is strongly recommended as the second exam to qualify the applicant for admission by meeting the second language proficiency requirement. Students who do not take an SAT Subject test in a second language must prove language proficiency through another approved process or fulfill the requirement after enrollment.

## 2. High School Subject requirements.

Resident applicants mustsatisfactorily (grade ofC- or above) complete at least 15 units (one year equal to one unit) of college preparatory work in the following areas, while non-resident applicants must satisfactorily (gradeof 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 (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 (deductive or 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 ( $\mathbf{3}$ units). Must include at leasta year in fields of inquiry based college preparatory sciencesuch as
biology, chemistry, 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.
- d. Social Studies (3 units). Must include analysis of societal is sues andevents. It is strongly recommended that study includes knowledge anduse of geographic information, patterns of United States history, patterns of human history, structures and systems of the US Government, and analysis 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 yearafter. Students may demonstrate proficiency by meeting oneof the following options:


## High School and College Options

- Pass with a C- orbetter, 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
- Education satis factorily completed through 7th grade in a school or country where English was not the language of instruction
- Satis factory performance (P) on a BrighamYoung

Foreign Language Assessment (BYU FLATS)

- Score of novice-high or higher 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 ACTFL scale in American Sign Language (ASL)
- Score of novice-high or higher on a ACTFLOral Proficiency Interview
- Credit for Prior Learning
**American Sign Languagequalifies as a second language.

Students failing to meet the Second Language Proficiency requirement at the time of admiss ion 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 Requirement has been met.

## Alternatives to the subject requirements. (Any one of the following.)

Score an averageof 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).

Take make-up coursework for specific 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 coursework for specific subject requirements missed in high schooland achieve a passing grade. Note: Satis factory 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 on holistic review.

NOTE: For the Academic Year 2020-2021 Portland State University changed its minimumadmiss ion high school GPA requirement for first-year applicants to a 2.5 or higher GPA for regular admission, with applicants whodid 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 transfer student, applicants must have a minimum GPA of 2.25 in 30 trans ferable quartercredit hours of college work. Applicants who present a
transferable 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 admission requirements.

## International Students

## 1. Writing proficiency requirement.

To be admitted as a transferstudent, applicants must satis factorily complete a writing course satisfying oneof the University's writing requirements (e.g. WR 121) or its approved equivalent 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/dis qualification will not affect the admissibility of a student whose complete academic record meets the minimum admission 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 reenroll at that institution to be considered for admission 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/admissions/transfer.

## Application

## Undergraduate International Students Application

Applicants who are notU.S. citizens who are currently overseas or reside in the U.S. on non-immigrant visas are cons idered for admis sion as international students. Candidates for admission may complete applications for the following terms if submitted by the following deadlines:

## International Freshmen

- August 1, 2021: Fall 2021
- December 5, 2021: W inter 2022
- March 5, 2022:Spring 2022
- July 5, 2022: Summer 2022


## International Transfer

- September 1, 2021: Fall 2021
- December 5, 2021: Winter 2022
- March 5, 2022: Spring 2022
- July 5, 2022: Summer 2022


## International Postbaccalaureate

- September 1, 2021: Fall 2021
- December 5, 2021: Winter 2022
- March 5, 2022:Spring 2022
- July 5, 2022: Summer 2022

Applications will be considered for all terms subject to departmentand/or University restrictions and/or course availability.

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

## 1. Application form and $\mathbf{\$ 5 0}$ nonrefundable application

 fee.The application and nonrefundable application fee are valid for one academic year only. The $\$ 50$ fee cannot be waived.

## 2. Official transcripts.

To be considered official, transcripts mustarrive in the Office of International Admis sions in a sealed envelope from the issuing 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 mustsubmit official transcripts fromeach college or university attended, regardless of whether or not they feel their prior academic study may be relevant to their PSU study. Transfer students with fewer than 30 quarter credits of college/university coursework are also required to submit transcripts fromtheir final four years of igh school/secondary school. Credits fromaccredited schools outside the U.S. will be trans ferred to PSU according to established international transfer credit guidelines and policies. See Academic Credit section ofthis Bulletin for
more information. Students who knowingly submit altered or falsified academic records or other application documents jeopardize their admis sion status and may have their admission rescinded and/or registration canceled.
3. Proof of English language proficiency if s eeking direct admission to academic cours ework.
4. Evidence of adequate financial res ources for educational and living expenses. (International applicants residing in the United States on vis as other than F-1 or J-1 student vis as may not be required to submit proof of financial resources.)

## 5. Proof of current immigration status (if already residing in the United States).

6. Admission validation. To validate admis sion, the student must register for classes during the initial termof admission. If the student does not register for this term, the application starttermcan 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 $\$ 50$ fee.

## Admission Requirements for Intemational Students

Applicants must demonstrate an appropriate levelof academic preparation.

Freshman: Completion ofU.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 transferable 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 Admissions. 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 international TOEFL 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 admis sion to the Intensive English Language Program(IELP). However, persons who want to study English before beginning academic study are eligible for conditional undergraduate or postbaccalaureate admission withoutminimum 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 English 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 and evaluation of transfer credits 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.

The Office of Admissions coordinates orientation programs for all undergraduatestudents new to PSU. All newly admitted undergraduate students are required to attend a new student orientation session before registering for courses.

After admiss ion to PSU, each undergraduate student must complete orientation programming beforetheirstart term. In-person
and online programming is available. To sign up for New StudentOrientation, 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 order to:

- 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, openhouses, and social events in which new students are invited to attend and encouraged to participate. For further information, vis it https://www.pdx.edu/admissions/viking-days.

## Student Orientation Programs

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# Academic Records, Credit, and Appeals 

## Student Records

The Univers ity 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 ifnecessary, 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 to PSU become the property of the University and are not intended for duplication or return to the student.

## Academic Record Sealed After Degree Earned

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, grade changes, changes to degree posting, or otherchanges to an academic record cannotbe made except by decision of the Scholastic Standards Committee or the Graduate Council.

## Academic Credit

A credit is the basic unit of measurement of educational accomplishment. One credit normally connotes 10 hours of lecture-recitation or 20 ormore hours of laboratory, studio, or activity work. The majority of courses at Portland State University involve three or four hours per week of lecturerecitation. PSU is on the quarter-systemcalendar. Semester credits transferred fromother 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

Undergraduate students who enroll in more than 21 credits perterm 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 programadviserusing the Overload Approval Form, to be submitted tothe Office of the Registrar in advance of the overload term.
- 26 or more credits: Students must obtain prior permission 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 mustobtain approval for regis tration in excess of 16 credits (graduate and undergraduate credits combined) via the Overload A pproval 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 formore than 16 credits must obtain approval fromtheirdepartment chair and the Graduate School.

ComputerScience andElectrical \& Computer Engineering graduate students have a lower maximum reg is tration limit of 10 credits. These students mustobtain approval to register for 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> from an accredited college or <br> university |

## Appeals and Grievances

Grievances and requests for exceptions 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 studentshould 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, the student may then appeal by writing a letter to the Academic Appeals Board. Appeals may be filed in the Office ofDean of Student Life, 433 Smith Memorial Student Union.

## Academic Requirements Committee (ARC)

The ARC is a subcommittee of the PSUFaculty 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 regarding 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 reason formissing the deadline.
The petition may be accessed at www.pdx.edu/registration/deadline-appeals-petition
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 gradeoption change, drop, add, and extension of an incomplete beyond the one year deadline; andadjudicating 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 reinstatementto 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

## Undergraduate Students Returning to PSU After an Absence

## Registration

Students who have been formally admitted or who have filed a Non-Degree Entry formmay register for classes 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 termcours eofferings can be found in the online Class Schedule at www.sa.pdx.edu/soc. Detailed instructions for regis 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 classes, 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 Calendarat
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 administratively drop student who not not attend class on the first class meeting. If this happens, the student 1) remains responsible for any tuition charges associated with the registration, and 2) the course may be recorded permanently on the academic record, depending on when the department processes the drop. 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 $\mathrm{X}, \mathrm{M}, \mathrm{NP}, \mathrm{W}$, or F grades for a
term whose attendance during that term cannot 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 ass igned 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 them from being able to register.
First-Year AdvisingRequirement:
www.pdx.edu/advising/first-year-mandatory-advising
Find Your Advisor: http://www.pdx.edu/advising/advisinglocations

## Residency Classification

At PSU tuition for Oregon residents is different from that of non-residents. The rules used in determining residency seek to ensure that only bona fide Oregon residents are assessed the resident fee. The Residency Standards used to assess 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 Res idency Officer in the Office of the Regis trar. 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 publis hed 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 Univers ity 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 form is used to create a student record and provide access to the registration system. There is a one time, nonrefundable fee. Non-degree students do not qualify for financial aid nor do 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/apply.
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-degreestatus, there is no guaranteeofadmission. Formal admission is required to earn a degree.

## Postbaccalaureate Status

Students seeking admis sion who have earned an accredited baccalaureate degree, who have not been admitted to a graduate degree programmay be admitted and enroll at the postbaccalaureate level. These students are admitted to Portland State to earn a second bachelor's degree, certificate, complete pre-requis ites for admiss ion 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 tbaccalaureatestudents are subject to the same academic policies as undergraduates.

## Senior Citizen Enrollment

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

1. space is available after degree-seeking seeking students have registered
2. the instructor or departmentapprove, and
3. the auditing student is a non-degree-seeking student registered for 8 or fewer credits.
One time administrative fees (e.g., \$25 for enrollment) and other course fees for materials and online access may apply. Registration, advising and enrollment support is through the Senior Adult Learning Center (SALC).
The tuition waiver does not apply to courses with Restricted Differential Tuition. Seniors taking clas ses 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. Please visit SALC in pers on at 470H Urban Center, online at go.pdx.edu/salc, or by phone at 503.725.4739.

## Veteran Educational Benefits Certification

## 503-725-8380

Most programs at Portland State University are approved for the training of veterans. The Veterans Adminis tration 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 SchoolOfficial for review for prior credit. Transcripts submitted fromall previous ly attended schools to the Admission Office will be accessible 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. governmentWebsiteat https://www.benefits.va.gov/gibill.

## Academic Credit for Military Training

After admission, credit may be granted for some types of military service courses on the college level where equivalency toPortland State courses canbe shown, as informed by the ACE recommendations. Veterans should provide transcripts fromappropriate military schools and a copy of VA form DD214 to the Veterans Certification unit of the Office of the Reg is trar 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 registration supports timely programcompletion in compliance with OregonHouse Bill 2565. Students being certified by the Registrar's Office for federal VA educational benefits will automatically be given veteran priority regis tration. Otherveteran 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-halftime | $6-8$ credits | $5-6$ credits |

The cumulative GPA at Portland State University required to maintain satis factory progress is 2.00 . VA benefits cannot be certified unless satis factory 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 over payment.

## Last Date of Attendance Reporting

For reporting purposes, the last date of attendance is es tablished using either 1) the actual date recorded in the registration systemwhen 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 these changes 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 termand receive a full refund. If sufficient course work has been accomplished and the instructor feels justified in granting credit for the course work completed, credit may be granted and norefund will be given.

The Office of the Regis trar will work with students on a case-by-case basis to determine the best courseof 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 financialpenalty, with full tuition and fee refund.
- Drop from some (but not all) cours es at any point during the termwithout 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 regis tration 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 discuss 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-s tate 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 Oregon while attending a school located in the State of Oregon (regardless of is/her formal State of residence) and enrolls in the school within three years of discharge
or release from a period of active duty service of 90 days 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 (regardless of his/her formal State of residence) and enrolls in the school within three years of the transferor's discharge or release froma 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 ofOregon (regardless of his/her formal State of residence) and enrolls in the school with in three years of the Service member's death in the line ofduty 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 so described 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 Websiteat
https://www.benefits.va.gov/ gibill.

## Missed Class Policy

## Purpose:

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

## Rationale:

Portland State University recognizes that students carry many responsibilities with them in to the classroom, which may both enrich their educational experienceand make it more challenging. These include university-sanctioned activities in which the student serves as a repres entative 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.
- Instructors ofstudents who participate in universitysanctioned activities, including faculty, academic professionals, adminis trative staff, and teaching assistants.


## Policy:

It is the responsibility of each instructor to determine and publish theclass attendancepolicy in the course syllabus and dis tribute to the enrolled students at the beginning of the quarter. The instructor may approve absences at their discretion, in accordance with this policy. It is the responsibility of the studentto inform the instructor of absences due to university-sanctioned events or personal responsibilities in writing at the earliest possible opportunity. If a student mustmiss class due to an unforeseen event, the student must inform the instructor of the reason for the absence. Absences notcleared with an instructor before the specific clas sevent (exam, presentation, assignment 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 instructor, the instructor will allow students to make up missed 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 is sue will be adjudicated by the chair of the department and then (only if needed) the dean of that school or their 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 StateUniversity should plan their study programs and workloads with a knowledge of the fee and tuition schedules of the institution. The Portland State Board ofTrustees 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 Class 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 use of University resources, including the Library, Center for StudentHealth 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 resources or services. Student taking 5 or more credits are also entitled to StudentHealth 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 assessed 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 admission requirements are waived forstudents in this category. Vis it 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. Formore, 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 enrollare financially responsible for all classes 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.

Accountstatements are available monthly in electronic format to currently enrolled student with a balance due. Notices are emailed to pdx.edu email addresses 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-financial/the-psu-payment-plan. Students may access their individual financial account balances by logging onto banweb.pdx.edu.

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

Admitted students taking one credit or more are assessed 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 not be 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 oftuition. Charges for special materials, if any, must be paid.

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

## Late fees

Late payment fees willbe charged on all missed payments.

## Other special fees

Special fees and fines are subject to change. Up-to-date information on specialfees and clarification of charges can be obtained from the StudentFinancial 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.student-
financial/files/Terms \%26ConditionsofPayment.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, and transcripts as well as additional assessment for collection charges and attorney's fees.

## Health Insurance

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

## Graduate Assistants

Graduate assistants (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 assessed 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 withdrawal or dropping of courses can be done through banweb.pdx.edu or in pers on with the Office of the Reg is trar. For tuition and fee impact, see refund schedule at www.pdx.edu/student-finance/refunds. Refund consideration is automatic; no special request is necessary.
Refunds of special course fees must be approved by departments. Complete withdrawal or dropping cours ework does not cancel a student's obligation to pay a student loan, 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 withdraw als

Students receiving financial aid who need to completely withdraw from classes during a termshould officially withdraw (see the instructions in the Schedule ofClasses).

By using theofficial withdrawal procedures, students will have tuition refunds calculated by the Student Accounts Department. Regardless of"official withdraw" or Financial Aid, StudentFinancial Services 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 fromwhich they were awarded, starting with the loan programs.
Students who are considering withdrawing froma term should contact staff in the Office of the Registrar.

## 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 missing grade.

Students who receive financial aid for a term and unofficially withdraw are identified at the end ofeach term. Each student receiving 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 financialaid 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 reasons beyond their controlmay petition for an earlier drop date via a Deadline Appeals petition obtained through the Office of the Reg is trar. 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 <br> <br> 503-725-3461 <br> <br> 503-725-3461 <br> askfa@pdx.edu <br> www.pdx.edu/student-finance <br> 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 as sistance, 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 Costof Attendance uses average amounts, it may not reflect students' actual costs.

The Office of StudentFinancial 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 reasonable contribution toward their costs fromearnings and savings. Financialaid 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 Federal Student Aid (FAFSA). The FAFSA canbe filed online at www.fafsa.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 their FAFSA as soon as possible after October 1st, and who provide all reques ted information promptly. It is recommended thatstudents 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 with in 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 A cademic Progress (SAP) Policy requirements described at the end of the Financial 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 established 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 undergraduatestudents may receive consideration for financial ass istance 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 EducationalLoans section.

## Post-baccalaureate students

Eligible post-baccalaureate students may receive consideration for financial as sistance through the Federal Direct Loan Program. Parents ofdependent postbaccalaureate students may borrow a Federal Direct PLUS Loan through theFederal Direct Loan Program, described in the Educational Loans section.

## Graduate students

Eligible graduate students may receive consideration for financial ass istance through theFederal TEACH Grant, and FederalDirect Loan Program, which includes Federal Direct Unsubsidized Loans andFederal Direct Graduate PLUS Loans.

## International students

International students are not eligible to participate in
federal financialaid 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. A ward amounts will be displayed on the PSU studentaccount at www.banweb.pdx.edu. Students must review and accept the terms and conditions forspecific awards ifnecessary, then accept or declineaid 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 studentaccountto pay tuition and other billed charges for enrolled students each term. Financial aid that exceeds billed charges is then delivered to the studentby the Portland State University Student Financial Services Office according to the preference that the student has established with the Univers ity. See www.pdx.edu/student-finance/financial-wellness-center for more information.

Federal Work-Study is earnedon a monthly basis and paychecks are is sued at theend of each month by the Univers ity's payrolloffice. Students may authorize direct deposit oftheir Federal Work-Study earnings to theirbank 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 dis burse if a student's registered enrollment level matches 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 2021-2022 aid year and minimum enrollment requirements for the various financial aid programs canbe 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 theirenrollment 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 balance due 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 dueon the student's account.

Students applying to borrow a federal student loan must be enrolled in a minimum of halftime credit hours, have demons trated need and/or eligible costs to receive a dis bursement from the 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 schooldeferment will enter the grace period orrepayment 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 Student Financial Aid by submitting a Revision Request for to update their enrollment plan and request a reinstatement of their federal student loan.

Any currenttermaid 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 dis bursement, depending on type of aid. Credits added after the census date cannot be used to increase aid eligibility. Retroactive aid (aid for a term that has ended prior to dis bursement) 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 dis bursement purposes are: A, B, C, D, F (if earned through course participation), $\mathrm{P}, \mathrm{I}$ or IP.

## Withdraw als—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 who begin attending classes and then stop attending prior to the end of the quarter are considered by the federal government to have unofficially withdrawn. For students 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 fromthe quarter, the University will consider the Withdrawal date to be the last date of attendance orparticipation in class by the student midpoint of the quarter as determined by the Univers ity. If University records show a federal student aid recipient never attended any class or performed any
academically related activity for a quarter orterm, 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 dis bursed 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 Financial Aid consumer information and guides at www.pdx.edu/student-finance.

## Educational Grants

## Federal Pell Grant

This federally funded grant programis designed to provide as sistance to eligible undergraduate students. The federal government determines the amount of the grant with the University acting as the dis bursing agent. Eligibility is determined by the Expected Family Contribution (EFC) that results fromthe student's FAFSA data. Students have a lifetime limit of the equivalent of 6 years of full-time enrollment for Federal 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 theState 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 located 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 who intend to teach full-time as a highly qualified teacher in high-need subject areas for at
least four years at schools that serve students from lowincome 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: IfTEACH Grant recipients failto complete the four-year teaching obligation, they must repay the grant with interest under theFederal Direct Loan program.

## Tuition Grants, Scholarships, and Remissions

A variety ofschool funded programs that provide tuition assistance 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

Athletic grants-in-aid and scholarships are administered by the institution's financial aid and athletic departments. Each head coach is responsible forselecting recipients based upon eligibility and athletic ability. The National Collegiate Athletic Association (NCAA) sets forth the eligibility and financial aid requirements forPortland State Univers ity 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 prospective student'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 DirectLoan Program

Portland State University participates in the Federal Direct Loan program. Under this program, funding forstudent loans comes fromthe U.S. Treasury and are disbursed by schools. When loan repayments are due, borrowers repay themdirectly to the federal government through a loan servicer as signed by the U.S. Department of Education. Any subsequentloans 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 borrowFederal Direct Parent PLUS Loans.
Federal Direct Loan applicants must submit a FAFSA to have their loan eligibility determined. After their loans have been awarded, they mustaccept them as part of their financial aid award acceptance process, and complete

Master Promis sory Note and satisfy entrance counseling requirements at www.studentaid.gov.

## Federal DirectSubsidizedStafford Loan

Subsidized loan eligibility is based upon 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 the six-month grace period 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 government has set annualborrowing 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 undergraduatestudy. Not alls students are eligible for the maximum loan amount.
Student borrowers must be enrolled in good standing at least half-time and have been accepted for admis sion to a programleading to a degreeor 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 Uns ubsidizedStafford 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 interest rates, vis it the U. 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 graceperiod, 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 $\$ 20,500$ peryear.

## Lifetime (aggregate) Federal Direct Loan Borrowing Limits by Academic Program

A student may borrow up to an aggregate 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 baccalaureatestudent (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 aggregate amount for graduate students includes all previous loans borrowed as an undergraduate or post baccalaureate student.

## Additional Federal Direct Uns ubsidizedStafford 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 additional funds above the maximum FederalDirect 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 Uns ubsidized Loan may be used to replace the Expected Family Contribution, but total FederalDirect Loan (subsidized and unsubsidized) borrowing, plus other financial as sistance 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 assistance the studentreceives during the periods ofenrollment. 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 his tory 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, visit 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 withoutfinancial 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 from the U.S. Department of Education. Interest is fixed for each loan, and begins to accrue at the time the first disbursement is made. For current interest rates, vis it 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 Federal Direct Graduate PLUS Loans.

## Private Alternative Loans

Privately funded education loans are not based on need, and no federal formula is applied to determine elig ibility. The amount borrowed cannot exceed the Cost of Attendance minus other financialaid, including other loans. Interestrates and repayment terms vary by lender, and should be carefully considered when making borrowing decisions. Privately fundededucation loans may be used to supplement the federal programs when the cost of attendance minus the maximum federal aid still leaves unmet need. For information on alternative loans, vis it the PSU website at www.pdx.edu/student-finance/financialaid/apply.

## Loan Repayment

Repayment ofFederal Direct 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 Federal Direct 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 FederalDirect 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 or enrolling in less than half time credit hours at Portland State University, borrowers must als o complete 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 FinancialAid 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 Work-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 involvedirectly serving thecommunity 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 Scholarship committee, or special committees developed for specific scholarships. Scholarships generally are awarded on the basis of academic achievement or promise, and financial need. 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 satis factory academic progress (SAP), as defined by federal regulations, toward completion of their programofstudy. Portland State University monitors the following: 1) student's course completion rate which is a percentagecalculated by taking the number ofPSU + transfer credits passed divided by PSU + transfer credits attempted but not passed, according to student level; 2) grade point average (GPA) for PSU + trans fer courses, 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 established 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 classes as long as they maintain compliance with satis factory academic progress requirements.

Multiple withdraws: financialaid recipients who withdraw from all of their classes, or who receive all non-passing grades in their classes TWICE with in the schoolyear, 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 level courses.

Students who do not meet all requirements of the satis factory academic progress policy during a termwill be placed on Financial Aid Warning; students who do not meet all requirements of the satis factory academic progress policy during a second termwill 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 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 expression, to gain an awareness of the broader human experience and its environment (local, national, and international), along with an ability to appreciatethe responsibilities of individuals to themselves, each other, and community.
Undergraduate students at Portland State University may work to ward a Bachelor of Arts, a Bachelor of Science, a Bachelor of Fine Arts, or a BachelorofMusic 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) Bachelor of Arts, Bachelor of Fine Arts, Bachelor of Music, or Bachelor of Science requirements, (5) requirements for major, and (6) 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 general education requirement. Specific requirements for a baccalaureate degree are detailed here. Students pursuing supplementary programs must complete 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 approved academic award given in conjunction with the satis factory completion of a programof instruction, signifying a standard ofknowledge in a specific subject. Certificate types vary, with some available as part of 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, distinct from and outside of the degreemajor.
For a list of available certificates and minors, see Programs of Study (p. Error! Book mark not defined.).

## Intensive English Language Program (IELP)

UCB Suite 400
503-725-4088 | 503-725-2311 Fax
es1@pdx.edu
Mailing Address:
Intensive EnglishLanguage Program
Portland State University
PO Box 751
Portland, OR 97207-0751
Street Address:
Intens ive English Language 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 Program is 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 graduatestudies.
(1) Academic Preparation for Undergraduate Study In this programthere are sixlevels from Level 0 (PreEntry) for low beginners to Level 5 for advanced students. New students must take the IELP placement exams given by the programthe week prior to the new term. Students placed in Level 0 (Pre-Entry) must successfully pass that levelbefore taking courses in Levels $1-5$. Full-time students in the Level 0 register for 22 credits per term. 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 Graduate Study (AP-G) courses may request to move fromlevel 4 directly into APG courses if they meet the following requirements:

- Complete EACH level 4 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 adv is 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 classes.

## 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. Allnew students must take a placement test in English administered 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 dis ciplinary 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 involve three or more departments in developing a curriculumto engage
students in an interdisciplinary area.

- Advertising Management Minor for Communication Studies Majors
- Business Minor in Advertising for Graphic Design Majors
- ClassicalStudies
- Climate Change Science and Adaptation
- Elementary Education
- Elementary Education Science
- History and Philosophy ofScience
- Law and Legal Studies
- 417Medieval Studies
- Neuroscience
- Secondary Education
- Special Education
- Sustainability250
- Sustainable Urban Development Systems


## 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 optimalmethods for the adminis tration 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-commissioned officers, i.e. sergeants), and officers.

Military History - Military activity has been a constant process over thousands of years, and the essential tactics, strategy, and goals of military operations have been unchanging throughouth is 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 notjustthe 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 centerpieceofmilitary 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. Portland State University and the Oregon Army National Guard offer a unique leadership development programspecifically for the civilian career-minded student. This program, Guard Officer Leadership Development or 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 commission as an Army officer upon 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 Bas ic Course is comprised of 100 and 200-level lower division 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 into 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 involvement, you get to see whetherthis role appeals to you.

## Advanced Course

The Advanced Course is a two-year pre-commissioning phase that integrates 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 assess your performance and provide you the essential feedback and reinforcement you need to become a leader in business, the community, and the Army National Guard.

Eligibility For The Basic Course. This course is open to any student enrolled at PSU.

Eligibility 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 Generalof 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 completed MS 100/200 level classes or attendedLTC (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 Basic 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 and engagement occurs at classroom, departmental and institutional levels. Your participation in assessment 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 assessments students might engage include standardized tests, placement tests, surveys, course evaluations, portfolios of student work, group or individual interviews, or clas sroomres earch, to name a few. Incoming students to PSU may be required to take a writing assessment and, based on the results of that assessment, take an assigned writing course.

## Academic standing policy

## Undergraduate, Postbaccalaureate and Non-Degree Seeking Students

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

## Academic Warning

Any student with 12 or more attempted credits (including PSU and trans fer work) whose cumulativePSU GPA falls below 2.00 will be placed on academic warning. A reg is 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 reg istering for 13 or fewer credits 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 PSUGPA 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 removalof 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 undergraduate credit is considered.
5. Students on academic warning or academic probation who receive only grades of I, X and/orNP will lose academic standing.

## Reinstatement

A student who is dismissed 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 Registrar 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. Reins tated students are given probationstatus.

## Graduate Students and Pos tbaccalaureates taking graduate level cours es

Graduate Academic Standing is adminis tered by the The Graduate School. See the GraduateStudies section of this Bulletin (p.41) 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 four types of CPL credit:

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 Academ ic 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/No Pass 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 institutional credit on thePSU 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 trans fer credit 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 notremove the prior grade fromthe GPA calculation.
7. Residency Requirement: CPL credit will not count toward the PSU credits in residence requirement.
8. Univers ity Studies Placement: CLEP and Military Credit will be combined with the transfercredit to establish placementinto the University Studies general education program. PSU Exam and Portfolio credit will not be used to es tablish placement.
9. CPL can be awarded in courses thathave 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, than a course in which the student has already received credit.
11. Department permission is required in orderto 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) specific requirements for the Bachelor of Arts, Bachelor of Fine Arts, BachelorofMusic, or Bachelor ofScience Degree, (5) requirements for a major, and (6) Second Language competency if admitted with a

High SchoolSecond 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-divis ion 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 higherthan 2.00 in major.)

Residence Credit: 45 of the final 75 , or 150 total must be taken at PSU. (Restrictions: PSU Exam 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 from regionally 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 frominstitutions that do not offer differentiated grades.)

Maximum number ofCredit for Prior 45

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 thatmay apply to a degree
(Note: to apply, courses must be at the advanced or academic college-level ofstudy, which is defined as equivalent to PSU "level 4 " courses orabove.)

## 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 Univers ity 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 univers ity credits are required to complete the following program(See www.pdx.edu/unst/ for cours edescriptions and capstone offerings):

- Fres hman Inquiry (15 credits). One year-long course which must be taken in sequence (UnSt 100-level).
- Sophomore Inquiry (12 credits). Students are required to choose three Sophomore Inquiry courses, each linked to a different University Studies cluster for a total of 12 credits UnSt 200-level).
- Upper-Division Cluster (Junior and Senior Years) (12 credits). Students are required to select three courses (for a total of 12 credits) fromone upper-division cluster ( 300 to 400 -level cours es designated with a U) which is directly linked to one of the three Sophomore Inquiry clas ses previously taken.
- Senior Caps tone (6 credits). This 6-credit capstone course (UnSt 421) is the culminating general education course forseniors. 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 trans fer students:

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

- Transfer students who have earned fewer than 30 quarter credits oftransfer work are required to complete all of the University Studies program requirements, including the entire sequence of Freshman Inquiry.
- Transfer students who have earned 30-89 quarter credits of transfer work are required to complete the University Studies programbeginning with Sophomore Inquiry as follows: 30-59 credits, three courses; 60-74 credits, two cours es; and 75-89 credits, one course. (The upper-division cluster must be linked to one of these Sophomore Inquiry clas ses.)
- Trans fer students who have earned 90-134 quarter credits of transfer work are required to complete the University Studies programbeginning with an UpperDivision Cluster. It is recommended that they complete the Sophomore Inquiry course directly linked to the Upper-Division Cluster they choose.
- Trans ferstudents who have earned 135 or more credits of trans fer work are required to complete the University Studies programbeginning with the Senior Capstone (6 credits).


## 3. University Writing Requirement-2 college-level composition courses

Students must complete 2 college-level composition courses or their approved equivalents. The requirement may be satis fied 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 trans fer credits meet the requirement with Wr 121 (required for transfer admission) and the requisite number of Sophomore Inquiry courses determined by placement into Univers ity 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 forwhich Wr 121 (or its approved equivalent) is a pre-requisite;
- Trans fer 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, Wr420 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 Intensive Courses or for questions about approved equivalents for composition courses, please email the English Department at eng@pdx.edu.

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

Courses taken to satis fy $\mathrm{BA} / \mathrm{BS}$ requirements may also be used to meet any other requirements 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 social science 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: one year of sciencecourses (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 and Letters and/or the Social Sciences distribution areas; and minimum of 3 credits in mathematical sciences/statistics. Science courses may, but do notneed to, be taken from the 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 satis fy the B.S. degree requirement for lab/field work.


## Academic Distribution Areas

- The Arts and Letters academic dis tribution area consists of undergraduate courses from the 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, Systems Science (SySc 421 only), Theater Arts, W orld Languages and Literatures, Writing.
- The Science academic distribution 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 477, Anth 478, Anth 479 only), Biology, Chemistry, Environmental Science and Management, Geography (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 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 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, Systems Science (SySc 336, SySc 338, SySc 340, SySc 342, SySc 350, SySc 413, SySc 418 only), Urban Studies and Planning, Women's Studies.

## Fine \& Performing Arts Requirement

The Fine \& Performing Arts area consis ts of undergraduate courses from the following College of the Arts subject areas: Architecture, Art, Dance, Film, Music, Theater Arts. Courses fromother colleges that satis fy 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.

## 5. 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 individualdepartment sections of this catalog.

## 6. High School Second Language Admission Deficiency

Students graduating fromhigh school in 1997 or later who did not meet the Second Language Proficiency requirement at the time of admission must complete the requirement prior to earning an undergraduate degree at Portland State University.

## SecondLanguage Proficiency Requirements (2 units)-

includes demonstrated proficiency equivalent to two years of the same high school-level second language. Students who did not meet this requirement in high school may demons trate proficiency by meeting one of 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 major requirements published in an annual PSU

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 issuance of the catalog. Example: The 2021-22 catalog requirements will expire at the end of summerterm 2028.

## 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 differentand 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 total216 at PSU.

## Minors

A Minor is an optional, undergraduate credential. It is a formal, defined setof 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.

## Undergraduate Certificates

A certificate is an approved academic award given in conjunction with the satisfactory completion of a program of instruction, signify ing 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 mustmeet 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 ofcertificates 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 ofstudy and is an optional credential. Undergraduate Admis sion is required, and as part of a baccalaureate degree program, this type of 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 admission is notrequired. Students may earn the certificate in the non-degreeenrollment 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, Postbaccalaureate or Graduate status.

## Postbaccalaureate Cre dential Requirements

## Second Baccalaureate Degree

A candidate fora second baccalaureate degree must complete the following:

1. Residence credit after earning first degree: if the first degree was fromPortland State University, 36 credits; if the first degree was from another college or university accredited by a recognized regional as sociation, 45 credits. Restriction: At least 25 of the 45 credits must befordifferentiated 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 ofScience degree: if the first degree was nota B.S., students must complete 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 socialscience
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 studentor as part of the first degree programcount toward the major. Students do not need to meet the general education requirement.
7. Admitted postbaccalaureatestudents 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 dismissal.
8. Postbaccalaureate students who do not hold a degree from a university in the U.S., English-speaking Canada, Great Britain, Ireland, Australia, or New Zealand must
satisfy the Wr 323 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 for students 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-speaking Canada, Great Britain, Ireland, Australia, orNew Zealand must satisfy the Wr 323 requirement.

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:

| A | $=4.00$ | $\mathrm{~B}-$ | $=2.67$ | $\mathrm{D}+$ | $=1.33$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $\mathrm{~A}-$ | $=3.67$ | $\mathrm{C}+$ | $=2.33$ | D | $=1.00$ |
| $\mathrm{~B}+$ | $=3.33$ | C | $=2.00$ | $\mathrm{D}-$ | $=0.67$ |
| B | $=3.00$ | $\mathrm{C}-$ | $=1.67$ | F | $=0.00$ |

Evaluation of a student's performance is determined by the following grades:
A-Excellent
B-Good
C-Satis factory
D-Inferior
F-Failure
P—Pass
NP—No pass
The following marks are also used:

## Grading System for Undergraduates

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 or better, although some departments may differ. (NOTE: At the graduate course level the equivalent of a B- grade orbetter is required to earn a grade ofP). Pass/NoPass 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 grade options 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 gradeor 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 satisfactory, but some es sentialwork 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 circumstances should be unforeseen or be beyond the control of the student. The instructor is entitled to requestappropriatemedical or other documentation to validate thestudent's request.

## 3. Incomplete grade is not a substitute for a poor grade.

The Incomplete grade is notmeant 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 reg is tering 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, and c) the date which the missing work is due. The latter may not exceed one year from the end of the term for enrollment for the given course. A template "Incomplete Contract" is available at www.pdx.edu/registration/grading-system.

## 5. Resolving the Incomplete.

Instructors may notencourage students 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 assignment should not exceed the original assignment. Students are fully responsible for monitoring all due dates.

## Other Rules:

## 1. GPA Calculation:

Incomplete grades are not included 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 change 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 cannot be removed.

## Drops and withdraw als

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 refer to 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 instructor concerned of the intended drop.

A student may withdraw for any reason before the end 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/performance upon 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 no credit and are not included when calculating GPA.

## M Grade: Missing Grade

M grades are automatically assigned by the systemwhen grades have not been submitted to the Office of Registrar 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 ofbona fide grading error as documented by instructor, 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 ins tructor, will be assigned a D, F, NP, or whatever grade the work has earned. Students who have notattended, nor participated in a course may receive an X grade.

## Grade Point Average (GPA)

The Office of the Registrar 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). SeparateGPAs 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 last grade 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 requis ite 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 repeatpolicy. 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 Councilof 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 term GPA 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 $\mathrm{P} / \mathrm{NP}$ credits).

## Part-time

Admitted undergraduate students with a cumulative GPA of 3.50 or better, carry ing 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 termof full-time enrollment or the awarding of Dean's List or President's List
- 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) over the combined terms


## Transfer Credit Policies

## Accredited colleges and universities

The Office of the Registrar, in consultation with academic units evaluates credits fromaccredited colleges and univers ities. Portland State University accepts collegelevelcredits earned in academic degree programs at colleges and universities accredited by regional accrediting as sociations and as recommended in Transfer Credit Practices ofDesignated 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 Univers ity 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 certify ing course content. Work fromunaccredited schools is evaluated in accordance with the institutions and policies
listed in TransferCredit Practices, published by the American As sociation of Collegiate Registrars and Admissions Officers. Credit given for a particular course will not exceed credit given for the equivalent or corres ponding 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 CoastCommunity 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/admis sions/co-admission.

## Associate degree transfer

Students who upon admis sion have completed an Associate of Arts-Oregon Transfer (AAOT) or an Associate of ScienceOregon Transfer-Business (ASOT-B) or an AssociateofScience 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 admis sion requirements.

## Oregon Transfer Compass Programs

## Core Transfer Map (CTM)

Transferstudents who present an earned CTM froman Oregon community college will be granted a minimum of 30 quarter credits applied to PSU generaleducation requirements.

## Major Transfer Map (MTM)

Major Trans fer Maps (MTMs) are statewide agreements that create streamlined and guaranteed paths for students transferring from an Oregon community college to an Oregon 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 TransferMap (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 collegeawarding the MTM.

When students complete an MTM, the general education courses in the "Core Transfer Map" portion of the MTM, for which minimum required grades havebeen 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 trans fer about how their courses will count towards general education requirements and degree/major requirements. If the MTM is not awarded advis ors can guide students to determine if they are eligible for a CTM. Students are responsible for informing the admissions 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 four years requires themto complete a minimum average of 15 credits per quarter (or 45 credits peryear).

## Oregon Transfer Module (OTM)

Transferstudents who present an earned OTM from another Oregon institution will be granted a minimum of 45 quarter credit 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 corres pondence credits are acceptable in transfer fromregionally accredited schools recognized as institutions of higher education.

## Comm unity and junior colleges

The number of lower-divis ion 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 school diploma is received are accepted in transfer provided the student receives grades ofD- 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 trans fer up to 48 credits of their professional health science work fromschools accredited by a regional association and/or as indicated in Trans ferCredit 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 thestudent. The residence credit requirement is satisfied by completing 45 of the last 60 credits at PSU, after admission to PSU and prior to formal enrollment in the qualifying professional program. The student must be within 48 credits of receiving a bachelor's degree from PSU at the time of matriculation into the professional program.

# Graduate School 

Rossitza B. Wooster<br>Dean of the Graduate School<br>184 Parkmill(1633 SW Park Avenue)<br>503-725-8410

## pdx.edu/grads chool

Portland State University graduate programs offer a variety of opportunities for advanced study and research, including preparation for academic or professional careers, continuation and improvement of skills for in-service professionals, 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 res earch and promoting the highest achievement of graduate students. It is the principal resource concerning graduate admission policies and procedures, advanced degree requirements, degreestatus, petition procedures, thes is 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 responsible for conducting the affairs of the Graduate School and forcertifying candidates who have fulfilled the requirements for advanced degrees.

## 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 assertion 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 School and the section listing the requirements for the degree and theofferings and requirements of the major department. The department chair appoints a faculty 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 graduatestudent 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 for poor advising on the part of an academic unit or poor planning by the student. The responsibility 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 admission is selective and meeting minimum requirements does not guaranteeadmission. 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 departmentalrequirements.
Univers ity admis sion requirements include:

- A bachelor's degree froma regionally accredited institution
- Minimum GPA. To be considered for Regular (p.43) admission, applicants musthave a minimum cumulative undergraduateGPA of 2.75 or the equivalent (on theU.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 from the degree granting institution(s) are eligible for University Conditional (p.43) 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 univers ities 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 ofofficial transcripts fromdegree granting institution(s) and all colleges and/or universities attended where any graduate credits 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, Eng lishspeaking 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 TestofEnglish-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 Admission-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 oftranscripts and degree certificates/diplomas
- Financial documentation demonstrating adequate financial support for at least the first year of study
Depending on the individual graduate program, additional departmental requirements may include:
- Personal essay 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 fromthe specific department.

## Three-Year Bridge program

This programis an alternatemethodofmeeting graduate admission 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 bridgethe 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. Cours ework 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 educationalobjectives to merit such action. 'Special Action' exceptions require submis sion of additional information. Examples of additional information needed to support the request for Special Action admission 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 admissions 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 admission 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 admission 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 assigned one of the following admission statuses:

## Regular status

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

## 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 Conditionals tatus. After completing 9 letter-graded graduate credits at PSU with a GPA of 3.0 or higher, students with University Conditionalstatus will automatically be given Regular status. Students with University Conditional status who do not earn a GPA of 3.0 orhigher after completing 9 letter-graded graduate credits at PSU 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 Univers ity 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 admission canceled by the department.

## Both University Conditional and Department Conditional status

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

## Postbaccalaureate

Students notcurrently working toward a degree but who wish to register for more than 8 graduate credits per term may be admitted to postbaccalaureatestatus. A postbaccalaureate studentmay 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 Univers ity requirements, and berecommended for admiss ion 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-admis sion credit to which all pre-admission limits and requirements apply. See Pre-admis sion and transfer credit (p. 46) for additional details.

## Enrollment

## Validation of admission

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

## 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-Satis factory
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—Missing 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-com pletion of course

A student who has participated in a coursebuthas failed to complete essential work or attend examinations, and who has not communicated with the instructor, will be assigned 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 ins tructor when the following criteria are met.

## Eligibility Criteria

1. Required satisfactory course completion/participation. The quality of work is satis factory, but s ome essential work remains. In addition, the student must have 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 as signing the Incomplete must beacceptable to the instructor. A student does not have the right to demand an Incomplete. The circums tances should be unforeseen or bey ond the control of the student. The instructor is entitled to requestappropriatemedical or other documentation to validate the student's request.
3. Incomplete grade is not a subs titute for a poor grade. The Incomplete grade is notmeant 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 regis tering 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 Registrar.
5. Resolving the Incomplete. Instructors may not encourage students 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 alternate assignment. Grading weight of the alternate assignment should not exceed 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 Graduate Council.
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 withdraw als

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 instructor concerned of the intended or completed drop.

A student may withdraw for any reasonbefore the end 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 Basis for Grade and is used when there is little or no attendanceand 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 assigned. An M grade will change to a grade of Xone 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 admission category on an audit (no-credit) bas is. 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 forscholarship 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 aw arded

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 forseven years; for example, the 2021-22 Bulletin can be used through summer 2028 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 800levelcourses 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 fromthose in the 400-level section. With the exception of coursework taken as part of a bachelors + masters program ( p .47 ) or pre-admission (p. 46) 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 level categories. 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 graduatecourse 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 graduatecourse 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 course cannot be taken again for credit at the 500 level.

## Correspondence credit

Under no circums tance will credit earned through corres pondence 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 reg is tration in excess of 16 credits (graduate and undergraduatecredits 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 formore than 16 credits must obtain approval fromtheir 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 mustobtain approval to register for 11 or more credits via the Overload Approval form.

## Minim um 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 phase of research, such as collecting or developing data, or when engaged in any aspects 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 registration 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 use of 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 thatstudents work in
close as sociation with other graduate scholars in the intellectual environment ofPSU.

In a master's program, to meet the residency requirementa student must earn a minimum of two-thirds of the credits required for the degreeafter formaladmis sion to a master's degree programat PSU.
In a doctoral program, the residency requirement can be satis fied in one of the following ways:

- Three terms offull-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 studentwas enrolled in the master's program.


## Pre-adm ission and transfer credit

Courses taken at any institution, including PSU, before the term of formal admission to a PSU graduate degree programare pre-admission credits. Courses taken at any other institution at any time are trans fercredits. 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 mustbe letter-graded B - orhigher or graded Pass. Pre-admission 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 preadmission and transfercredits (whether taken at PSU or elsewhere) and applied to master's degree requirements must also meet all the following requirements: must notbe used for any other degree at any institution (except fordual master's degrees (p.48)); 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-admis sion 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 certificateprogramand 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-admission and transfer limits are at the discretion of the individual doctoral programs. Trans fer 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 graduateGPA. However, transfer courses are included in the approved programofstudy 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-admission 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 ofeligibility.

## Joint campus courses

Admitted graduate students at PSU may take graduate courses offered by the University ofOregon orOregon Health and Science University through the Joint Campus registration process. Joint Campus (JC) registration allows PSU students to have a graduate course fromUO orOHSU included in their current termenrollment and tuition assessment at PSU. For additional details, see the Graduate School webs ite. JC courses will be listed on the student's PSU transcript, however, JC courses are considered transfer credits (p.46) 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 programofstudyat PSU.

## Course overlap between degrees and certificates

In specific circumstances, coursework only (not a project, thesis/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 beenused to meet the requirements for a bachelor's degree or any undergraduate program cannot be applied to any graduate program (degree or certificate) unless the courses are part of a bachelors+masters program (p.47) 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 degree (p.48) allowance.
- Graduate courses can be applied to a master's degree and a doctoral degree pro vided the master's degree is awarded prior to 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 master'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 mustbe 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 admiss ion to a bachelors+masters program cannotbe 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
considered pre-admis sion credits when applied to the master's degree.

After admission to a bachelors+masters degree program, students must maintain an institutionalundergraduate GPA of 3.30 and earn a B or higher in graduate courses taken for shared credit. Upon completion of the bachelor's degree, students who meet those requirements will be guaranteed admission to the master's programwith shared credits. Students who donot meet thoserequirements would need to apply for admission to the master's degree program without the benefits ofbachelors+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 differenttotal credit 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 graduates tudent in good academic standing may request a leave of absence. A leave of absence provides a guarantee that the student will be allowed to return to their graduate programat the agreed-upon time and exempts the student from the 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 or engage in any activities that require faculty time or use of University resources. It is the student's responsibility to drop or withdraw fromall courses as well as notify other appropriateoffices 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.

Students submitting the Graduate Re-Enrollment Request who have enrolled in coursework elsewhere since PSU admission mustalso submit one sealed, official transcript to Graduate Admis sions fromeach institution attended subsequent to PSU graduate admission.
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 same enrollment status and the same academic standing, which they had when the military service began ifthey wish. The period of military service and an additional period of up to threeyears (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 presentappropriatedocumentation) 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 admission, that admission will be canceled unless the student contacts Graduate Admis sions and requests that the admis sion be updated to another termwithin a one-year period. If the student does not validate admis sion with in a one-year period, the admission will be canceled and thestudent 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 programofstudy for the degree OR does not make satis factory progress toward the degree (as determined by the department) may haveadmis sion to the degree program canceled. Additionally, a doctoral student who has not been registered for three years will have admis sion to the degree program canceled. 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 ins tructor are not eligible to receive an advanced degree in their own department or school at the University; however, in special circums tances, 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 graduatecredits earned at PSU. All graduate students, especially those in a conditional admission status, are expected to keep in close communication with their departments and to avail themselves of departmental advising.

## Academic probation

An admitted graduatestudent is placed on probation if their cumulative graduate GPA at PSU, based on the completion of 9 or more letter-graded graduate credits after admission 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 dissertation committee appointed, to receive or continue to hold a graduate assistantship, or to reg is ter 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

Disqualification 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 notautomatic. A disqualified student may petition for readmission as a student in a graduate certificate or degree programafter one calendaryear. Readmis sion after the mandatory oneyear period is initiated by the student's filing of a petition
for readmission to the GraduateCouncil through the Graduate School. Such a petition would need to address the circums tances 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 readmis sion, with or without additional academic requirements, or may recommend continued disqualification. A readmitted student must rais e the cumulative graduate GPA to 3.00 or higher within the first 12 letter-graded credits after readmission or the student will be dis qualified.

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, uniquerelationship and responsibility to the faculty of the academic departments, the faculty upon whose recommendations graduate degrees are awarded. A major feature of the graduate student'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 admission 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; misrepresenting a person's identity to an instructor or other University official.

## Tuition, fees, and aid

## Basic graduate fees

Tuition and fees as sociated with graduatestudy at PSU are available from Student Financial Services. The admission application fee is required and is nonrefundable. All newly admitted graduate students are assessed a one-time graduate matriculation fee in their initial term of admission. Graduate tuition and fees assessed each term dependon the total number of credits in enrolled classes, differential tuition, and resident ornonresidentstatus in the state of Oregon.

## Financial assistance

## Graduate assistantships

The University offers graduate assistantships for teaching, research, and admin is trative 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 to wards their degree. Students wishing to apply for graduate assistantships mustcorrespond directly with the appropriate department offering the assistantship.

## Scholarships

The Graduate School adminis ters several 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, res idents of Alaska, Arizona, California, Colorado, Commonwealth of Northern Mariana Is lands (CNMI), Hawaii, Idaho, Montana, Nevada, New Mexico, North Dakota, South Dakota, Utah, Washington, and Wyoming admitted to specific degree programs are assessed residenttuition. A full list of approved programs is available on the application form. Completed applications are submitted to the Graduate School.

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

## Graduate programs

## Graduate Certificates

A graduatecertificate programis a linked series of approved graduate-levelcourses which constitutea 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 ofthe sequence ofcourse materials.

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

The Univers ity 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 experience in research.

Candidates for the Master of Arts andMaster of Science degrees must earn a minimum of 45 credits in approved graduate courses; many programs have higher minimums. A thes is may be required, depending on the program. The Master of Arts degreerequires 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 ofScience in Teaching degrees 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 programofstudy includes the following:

1. At least 24 graduate credits 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 oralexamination 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 Philos ophy 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 othereducational 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 cannotbe 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 establish 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 graduatecertificate with the specific written approval of the program. Grades of Dor 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 2014 will be beyond the seven-year limitation at the close of fall term 2021).

For graduate certificates, transfer credit 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 minimums. See the section on Course overlap between degrees and certificates (p. 47) 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 perapplication 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 providean explanation for the graduation delay. Ifstudents 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).

## Master's degrees

## Secondlanguage 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 World Languages and Literatures has determined that the second language requirement for M.A. and M.A.T. students canbe met in the following ways:

1. Equivalent coursework: Students who have passed a course equivalent to PSU level 203 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 World Languages and Literatures will issue a certificate of completion. M.A. andM.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 the requirement under 1. above should make an appointment with the Department of W orld 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 level203 or above in residence or abroad
d. Special reading courses, if available.

The Department of W orld 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 World 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 admission and are not required to demonstrate additional competency except as necessary to complete their degree requirements.

## Cours ework and program of study

In the first year a student should prepare a proposed programofstudy in consultation with the faculty adviser. The purposeof the planned programof study is to present an organized, individualized plan for coursework, practica, and research activities consistent with the requirements for the proposed degree and approved by the faculty adviser.

If PSU pre-admission credits are to be included on the programofstudy, 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 programof study, the Proposed Transfer Credit form(GO-21M) must be submitted to the Graduate School for approval. See Preadmission and transfercredit (p.46) 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 programofstudy, 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 C+, 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 termofformal admission 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 formaster'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 mustbe 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 transcriptafter 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 2014 will be beyond the seven-year limitation at the close of fall term 2021).

## 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 perapplication 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(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 theappropriate 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 2011 may be validated for a graduation termno later than fall 2021). 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 currentrequirements 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 the exam. Payment must be arranged in advance of the examthrough 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 course department, a student may validate a graduate course from another regionally
accredited institution, in accordance with the full requirements listed on the GO- 15 form.

## Human Res earch 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 res earch 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 untilHRPP 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 res earch project. A minimum of 1 graduate credit of registration is required when taking 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 dis cretion of the department, a faculty member from another department may be added. For M.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 thatterm. For summer term graduation, the deadline applies to the regular eight-week summersession dates, i.e., exams must be scheduled and completed by the Friday of the eighth week of summer term.
Passing of the final oral examination 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 offinals 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 departmentmay dismiss the student fromthe master's degree programorpermit 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 thesis 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 orOHSU faculty. If it is necessary 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 graduatecredit in every termin which they are working on any phase of their thesis, including data development or collection, writing, revis ion, 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 thes is 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 offinals week). For summerterm 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 thesis to all members of the approved committee no fewer than 14 days before the thesis defense.

A thes is defense must take 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 not exceed 60 minutes. The thesis defense is open to the University faculty and may be open to thepublic at the department's discretion. Passing of the thesis defense requires a majority approval. If the student fails the thesis defense, the departmentmay dismiss the student from the master's programorpermit the student to hold a second defense after a minimum of three months. The results of the second defense are final.

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 forspecific dates. For details 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.

## Advis ory committee

An advis ory committee for the doctoral degree student should consist of at least three faculty members representative of the student's field of study. When a student enters the doctoral program, a faculty adviser will be designated by the program director to advise thestudent and to meet in regular consultation concerning the program of study and research. The additional members of the advis ory committee will be appointed after successful completion of 9 credits and not later than sixmonths prior to the completion of the comprehensiveexaminations.

## Language requirement

For the Ph.D. degree, the student may be required to demonstrate competency in at least one second language. This requirement is determined by the governing unit of the student's program, department, or school. 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 offull-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.


## Cours ework and doctoral program of study

The doctoral programofstudy includes coursework, research, internships, and/or seminar credits according to the requirements of the individual doctoral program. A minimum 27 credits of603 Dissertation 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 programofstudy 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. Trans fer credits are approved via a GO-21D form submitted to the Graduate School. See Pre-admission and transfer credit (p.46) for detailed information. While potentially all cours ework for the degree can be transferred from another 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 programofstudy, 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 ofC,+ C , and C - are below the
graduate standard, they may be counted as credit toward a doctoral degree with thespecific written approval of the doctoral program. Grades of D orF 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 student is progressing in an acceptable manner toward completion of the work; final grades for 601 and 606 credits are assigned 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 Dissertation 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 programof 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.
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. Failure to meet this time limit will result in cancellation of admission 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 notbe 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 dismiss 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. Theresults 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 thedoctoral program.

## Dissertation propos al

After passing the comprehensive examination and identifying a dis sertation topic, a dis sertation committee is appointed and the student must pass a proposal defense. The dissertation committee will take the place of the advis ory committee and the faculty adviser 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 sistant 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 neces sary 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 res ponsibilities remains with thechair.

No proposal defense shall be valid without a dissertation committee approved by the Graduate School. The GO-16D form should be submitted to the GraduateSchoola minimum ofsix weeks in advanceof the estimated date of the dissertation 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 the entire, appointed committee. While it is expected that all members 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 presentstatus 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 thestudent for advancement to candidacy once the dissertation proposal has been approved.

## Human Res earch Protection Program

All research involving human subjects conducted by faculty, staffor 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 student must submit a HRPP application to theOffice 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 studentis advanced to candidacy after successful defense of the dis sertation proposal and with the recommendation of the doctoral program, after verification of the student's programof study, and after HRPP approval has been granted (if applicable). The doctoral programmust request advancement 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 offive years from the effective date of advancement to candidacy to complete all requirements for graduation, including defenseof 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.

## Diss ertation 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. Until the degree is granted, the student enrolls for the number of graduatecredits appropriate to the amount of University services utilized, as determined by the dis sertation 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 theterm a student graduates, even if this results in more than 27 (18) credits of603 Dissertation at the time of graduation. Ph.D. and Ed.D. students should only register 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 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 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 assessed 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 mustdeliver a final draft of the dissertation to all members of the approved committee no fewer than 14 days before the dis sertation defense.

The dissertation defense, which is open to the public, is the culminating experience in the doctoralstudies. The candidate is expected to prepare an oralpresentation on the research methodology and results. Theoral presentation should not exceed 60 minutes. Following the oral presentation, the candidate mustdefend 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 dissertation. The questioning and discussion are for the purposeof: (1) further enlightenment 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 all members should be physically present, remote participation is permitted under specific conditions. For dissertation approval, there may be no more than one dissenting vote on the dis sertation defense. If the student fails the dissertation defense, the doctoral programmay dismiss the student fromthe programor permit the student to hold a second defense after a minimum of three months. The results of the second defense are final.

The final dissertation 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 thesis formatting and submis sion, see the Thesis and Dissertation Information available from the Graduate School.

## Time limitations

For students 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 admission 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 fourmonths and a maximum of five years from the effective date of advancement to candidacy to complete all requirements for graduation, including defenseof 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 admission to the doctoral program.

# A to Z List of Student Services 

## Advising and Career Services

The Advising \& Career Services Divis ion 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 Advis ing Resource Center serves as the hub for the 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 ifthey change their major. Students are as signed to an advis or who helps themto understand graduation requirements, create degree plans, and successfully achieve their educational goals. (Please notes ome Advising Pathways are served in other locations.)

## University Career Center

FMH342
503-725-4613
www.pdx.edu/careers
The Univers ity Career Center provides support to all PSU students and alumni in all aspects of theircareer development including: exploration, preparation and planning, job and internship searching, and making career changes and transitions through individual appointments, drop ins, works hops, clas ses 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

FMH342
503-725-2136
www.pdx.edu/transfer-center/
The Transfer and Returning Student ResourceCenter (TRSRC) helps prospective transfer students, and students returning or enrolling after a break in their education, smoothly transition to PSU. The TRSRCsupports transfer and returning student degree completion through early and proactive academic and career advising and provis ion of assistance with accessing PSU resources and services.

## ASPSU Children's Center

Smith Memorial Student Union, First Floor 1825 SW Broadway
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 fhild 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 months to age 9 .

Box Office
Box Office
120 Smith Memorial Student Union
Broadway Lobby
503-725-3307

## portlands tate.universitytickets.com

The Portland State BoxOffice is yourone-stop shop for event tickets, campus information and locker rentals. We serve as the Information Desk for the university, and sell tickets for university events and external events held at Portland State venues, ranging from commencement ceremonies and Viking Athletics' games to studentorganized functions and cultural events. Purchase event tickets online at portlands tate.universitytickets.com or in personat 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 ofon-campus events every year. Recognized student groups, PSU departments and external org anizers can plan their gatherings with the assistance 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 also 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 ofPublic 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 enforcements ervices to the Univers ity community. Public Safety Officers engage in preventative patrol to observe and report, may respond to calls for service that donotrequire the exercise of police authority.

Campus Dispatch is a 24-hour central communications hub located at 633 SW Montgomery that provides the University community with access to a myriad of resources both internally and externally, including butnot 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 froma 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 reg is 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 environment wherequality 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 offer faculty, staff, alumni and plus one memberships.
As one of the largest student employers on campus, we support the occupational wellbeing of PSU 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 swim, women-only swim, and special events that are available to Campus Rec members for free. Adult swimclinics, youth swimlessons, 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. Weoffer cardio, endurance, strength, mind/body, and dance fitness classes led by certified and motivational ins tructors. Our affordable personal training programbrings clients closer to their goals, and our wellbeing teamengages the entire campus community with annual events 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.

## Intram urals

Intramural Sports provide Campus 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 (indo or and outdoor), volleyball, slowpitch softball, 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 ofopportunities including guided outdoor trips, works hops and certification courses, outdoor rental gearat 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.

## Commencement

commencement@pdx.edu
www.pdx.edu/commencement
"Graduation" and "Commencement" are terms of art at PSU. "Graduation" means actually fulfilling your degree requirements resulting in a diploma. In other words, "Graduation" is the technical obtainment of credits to receive a degree.
"Commencement" is the symbolic ceremony marking the closing of your academic career where you receive commendation for your hard work at PSU. It is an opportunity for you, your family, friends, and the PSU community to celebrate your accomplishment. Official diplomas are mailed to the student after their graduation term. Details about submitting an application to graduate, and registering for one of Portland State's Commencement ceremonies can be found on the Commencement website.

## Committee for Improving Student Food Security

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

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

CISFS provides several services to PSU students, including:

Free Food Market, a monthly distribution of free produceand pantry staples
SNAP Application Assistance. We coordinate a calendar of walk-in availability for students to ask questions or get assistance 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-res ource-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 StudentCenter
Smith Memorial Student Union
1825 SW Broadway, Suite 229
Portland, OR 97201
503-725-6710
www.pdx.edu/cultural-res ource-centers/la-casa-latina-student-center

La Casa Latina StudentCenter(LCL) is a hub on campus where Latino/a/xstudents and their allies come together to build 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 Casa Latina Student Center is to attract Latino/a/x students to Portland State University and to provide cultural, social, and academic services and programs that enhance 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!

Middle Eastern, North African, South Asian Student Center Initiative
Smith Memorial Student Union
1825 SW Broadway, Suite 228
Portland, OR 97201
503-725-5342
www.pdx.edu/cultural-res ource-centers/middle-east-north-africa-south-asia-initiative

The Middle East, North Africa, South Asia (MENASA) Initiative is a Cultural Resource Centers programwith the goal of creating a sixth center to support the MENASA student community at PSU. The Initiative 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 thesescholars. Currently, The MENASA team is working to help the CRCs raise the funds needed to complete the CRC expansion and accommodate space for MENASA. In the interim, the teamis also working to open up a temporary MENASA Center on the second floor of Smith this coming fall 2021.

Multicultural Student Center
Smith Memorial Student Union
1825 SW Broadway, Suite 228

Portland, OR 97201
503-725-5342
multicultural@pdx.edu
www.pdx.edu/cultural-res ource-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. Resources 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 Cultural Resource Center Programs
Native American Studentand Community Center 710 SW Jacks on Street
Portland, Oregon 97201
503-725-9701
www.pdx.edu/cultural-res ource-centers/native-american-student-community-center-student-programs www.pdx.edu/native-american-center/
The NASCC Senior ProgramCoordinator is located at the Native American Student and Community Center. Their work includes supporting students in multiple ways. Some of them include; student centered-programming, supervis ion 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 NASCC Manager to support all students that access any of the cultural res ource centers on campus.
Pacific Is lander, Asian \& Asian American Student Center Smith Memorial Student Union
1825 SW Broadway, Suite 235
Portland, OR 97201
503-725-9391
www.pdx.edu/cultural-res ource-centers/pacific-is lander-asian-asian-american-student-center

The Pacific Islander, Asian and Asian American (PIAAA) Student Center at Portland State University offers an engaging and accepting space to address the diverse and changing needs of our Asian and Pacific Is lander 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-res ource-centers/pan-africancommons

The Pan-A frican Commons (PAC) cultivates cultural, personal, academic, and professional developmentand opportunities through programming and resources that foster empowerment, enrichment, and principled solidarity that advocates liberation among peoples of the African diaspora. Allstudents 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-s tudent-life
The Office of the Dean of Student Life (DOSL) fosters studentengagement, learning, and success through various programs and resource centers. DOSLalso oversees Student Conduct \& Community Standards, Housing and Res idenceLife, the Bas ic Needs Hub, and the C.A.R.E. program. Students can come to DOSL if they haveconduct is sues, experience difficulties outside of the classroom affecting their academic success, would like to get involved in campus life, or questions/concerns and don't know with whom to speak.

## Disability Resource Center

Disability Res ource Center
116 Smith Memorial Student Union
503-725-4150
drc@pdx.edu
www.pdx.edu/drc
The Disability 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 orminimizing barriers in the environment so that they have the ability to be successful at PSU. We advocate on behalfofstudents as necessary in order to ensure other PSU faculty and staff are working toward the same goals in helping the student to the greatest extent possible. We also connect the student with other on-and off-campus res ources as needed. Information about disability 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 permanent records or transcripts. Come visit us in the DRC and learn more!

## Diversity and Multicultural Student Services

Diversity and Multicultural Student Services
Smith Memorial Student Union
1825 SW Broadway
Suite 425
Portland, OR 97201
503-725-4457
www.pdx.edu/dmss
Divers ity and Multicultural Student Services (DMSS) serves and empowers student populations whose access, retention, academic success, and graduation are most challenged by socio-historical factors and contemporary inequities.
Our mission at DMSS is to provide an accessible inclusive environment that enriches the university experience and engages students, their families, and the community. There are seven departments with in the DMSS unit: Multicultural Retention Programs (p. 64), Student LegalServices (p. 70), Dis ability Resource Center (p. 62), TRIO Student Support Services (p. 71), CulturalResourceCenters (p. 60), and the Veterans Resource Center (p. 72).

## Global Diversity and Inclusion

503-725-5919
www.pdx.edu/diversity
Richard \& Maurine Neuberger Center
1600 SW 4th Avenue, Suite 830

Global Diversity and Inclusion is the central divis ion that leads and facilitates the continuous quest for Inclusive Excellence at Portland State University.

Diversity, equity, and inclusion is not only a value and a mission ofPortland State University, it is the essential framework of who we are and what we do as an institution and community. GlobalDiversity and Inclusion is the central div is ion that leads and facilitates the continuous quest for Inclusive Excellence. We structure our ongoing diversity, equity, and inclusion journey through four pillars:

## Diversity Education \& Learning >

Global Diversity \& Inclusion offers diversity, equity, and inclusion education addressing a variety of topics, needs, and experience levels. We provide a body oflearning opportunities of breadth and depth, frombeginner to advanced.

## Student Support \& Engagement >

We commit to inclusion of historically marginalized communities and those underrepresented in higher education. Diversity and Multicultural Student Services (DMSS) serves and empowers student populations whose
success, retention, academic success, and graduation are most challenged by socio-historical factors and contemporary inequities.

## Equity \& Compliance >

To learn to teach, to generate new knowledge for the benefit of humankind... To Let Knowledge Serve ourcity, our region, our state, and our world. This is the purpose of Portland State University. To achieve our purpose requires that together we, each of us, take responsibility for and guard againstdiscrimination and harassment, and their pernicious effects.

## Diversity, Equity \& Inclusion Advocacy >

Divers ity, equity, and inclusion advocacy requires the ongoing examination of all endeavors, activities, practices, structures, and systems of Portland State University. We seek to identify the barriers and challenges to diversity, equity, and inclusion. We advocate for any and all needed changes that aid in making every pers on feel welcome, wanted, valued, and partnered with for their success.

## Helen Gordon Child Development Center

## Helen Gordon Child Development Center 1609 SW 12th Avenue

503-725-3092
www.pdx.edu/helen-gordon-center/
The Helen Gordon Child Development Center is a University-operated service that provides a quality educational laboratory preschool/extended day program for 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.edu/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 Centerstrives to foster the learning process by empowering PSU students to accomplish their academic and personal 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 measurable 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 page on our webs ite, or call 503-725-4448.

## Tutoring Services

The Learning Center provides free peer tutoring services in math, sciences, and world languages. The goal of our tutoring program is 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 offer Live Streams for selected courses. All tutors are current PSU undergraduate and graduate students thathave 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 thathinder 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, pers everance, 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 (trans fer student), or simply in need of a motivation jump start, there is much to gain fromthis course. Lower and upperdivis ion options available. For more information, or to see the upcoming schedule, see the collegesuccess 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 res ources 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 PSUutilizes.

## 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 resource page on our website.

## Little Vikings and Baby Vikings

Little Vikings
Epler Hall, 1st Floor
503-725-8800
www.pdx.edu/s tudents-with-children/little-vikings

## Baby Vikings

Smith Memorial Student Union, 1st floor
503-725-9622

## www.pdx.edu/s tudents-with-children/baby-vikings

Little and Baby Vikings provide walk-in, reserved, and occas ional care for children ages 6 weeks to 12 years old. You can reservecare for the entire term, up to 5 hours per day and 20 hours per week. In addition to drop in care, Baby Vikings offers several full-time childcare slots available by reservation only. Little Vikings also provides day camps for days when Portland Public Schools do not have 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 stuffall over campus. Shortterm and long-termgeneral lockers are available for rent year-round through the University BoxOffice 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 rental fee.

## 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/orh is 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 Diversity Scholarship Program is to expand and enrich Portland State's learning community by recognizing and supporting outstanding students from first generation and various cultural, ethnic and socio-economic backgrounds, with diverse talents, interests, and life experiences. The Diversity Scholarship Program is committed to helping students achieve their academic goals. The programpromotes diversity and student participation in campus life through volunteerismand
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 diasporathrough services and res ources for incoming fres hman, 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 Student Services assists students who are seeking a cultural connection at Portland State University through community building activities and connecting themto both PSU student groups and faculty,
as these are essential components to achieving academic success.

Asian and Pacific Is lander Student Services
Smith Memorial Student Union
1825 SW Broadway, Suite 425F
Portland, OR 97201
503-725-4457
www.pdx.edu/diversity/student-support-programs
As ian, 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, organizations, 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 fornew and continuing students at PSU. APID Student Services welcomes all students who seek resources, support, and a sense of community that will enable themto 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 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 studentgroups and faculty, an essential component to achieving academic success.

Native American StudentServices
Native American Student and Community Center
710 SW Jackson Street
Portland, OR 97201
503-725-5348
www.pdx.edu/multicultural-retention-services/nations
The Native American Student Services Programprovides support forNative American and Alaskan Native students through general advising, guidance, advocacy and referrals to appropriate campus-based and Portland Metro resources, especially organizations serving Native American people.
Native American Student Services connects students to opportunities for Native American cultural enrichment and social activities, both on campus and in the community.

## Native American Student \& Community Center

PSU Native American Student and Community Center
710 SW (andrew) Jackson Street
503-725-9695
nascc@pdx.edu
go.pdx.edu/nascc
The PSU Native American Student \& Community Center (NASCC) is a beacon to PSU's commitment to American Indian tribes existing nation to nation treaty relationships. The 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 for Native American, Alas kan Native, Pacific Islander students and our allies through tradition, ceremony, and storytelling. In addition to its own staff, the center also houses a Multicultural Retention Services StudentServices Coordinator, CulturalResourceCenters Senior ProgramCoordinator, four student groups, a ten station computer lab, a children's area, and a quiet study area with a fireplace. All students are welcome!

## Queer Resource Center

Queer Res ource Center
458 Smith Memorial Student Union
503-725-9742
qre@pdx.edu
www.pdx.edu/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 persist to graduation through increasing equity and access for queer and trans students at Portland State University. TheQRChosts 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 <br> www.pdx.edu/regis tration

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 ClassroomAssignments
- 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 Ronald E. McNair Scholars Programat Portland State University works with undergraduates who want to pursue Ph .D. degrees. It introduces juniors and seniors who are first generation and low-income or members of underrepresented groups to academic research and to effective preparation and strategies for getting into and graduating from Ph.D. programs.

The McNair Scholars Programhas academic-year activities and a full-time summer research internship. Scholars take academic and skills-building seminars and workshops during the year, and each scholar works closely with a faculty mentor on original research in the summer. Scholars present their res earch findings at the McNair Summer Symposiumand at other conferences, and are encouraged to publish their papers in the McNair Journal and other scholarly publications.

## Services for Students with Children

Services for Students with Children
462 Smith Memorial Student Union
1825 SW Broadway
Portland, OR 97201
(503) 725-9878

## www.pdx.edu/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 goal. We offer subsidized child care tuition for eligible students through the Jim Sells Childcare Program; drop-in flexible childcare on-campus at Little and Baby Vikings; social and information events and celebrations; several family-friendly study rooms on

## SHAC Student Healt and Counseling

campus; a free clothing closet and food pantry; and much more! We also support pregnant and postpartumstudents through individual consultation, and we oversee the 13 lactation spaces on campus. We actively advocate for student parents to faculty, staff, and administration.

## Center for Student Health and Couns eling (SHAC) University Center Building 1800 SW 6th Avenue

## www.pdx.edu/health-couns eling

The Center for Student Health and Counseling (SHAC) provides high quality, accessible medical, counseling, dental, testing, and health promotion services to PSU students. All students taking five (5) or more* in-load credit hours in a term are assessed a Student Health Fee which provides access to SHAC services, no matter what health insurance they carry. The StudentHealth Fee is assessed on a per-termbas is and is non-refundable.

Students who are SHAC-eligible in Spring term, and either graduate in June or do not plan to attend summer term, can still use SHAC services through the summer on a fee-forservice basis.

Vis it www.pdx.edu/health-counseling for more information about SHAC's services.
*SHAC Dental Services is available to PSU students enrolled in one (1) credit hour or more per term.

## SHAC Counseling Services

Couns eling Services
University Center Building, Suite 200
1800 SW 6th Avenue
503-725-2800
www.pdx.e du/health-counseling/couns eling
Counseling Services in the Center for StudentHealth \& Counseling (SHAC) offers a variety of services designed to support the emotional well-being ofPSU students. Services are provided by a professional staffof licensed psychologists, social workers, psychiatrists, and doctoral and master-level students in training. Services include: initial consultations, brief individual therapy, group therapy and support groups, emergency/crisis counseling, psychiatric assessment and treatment, referralassistance, psycho-educational workshops and trainings, and consultation for the campus community. Counseling Services also offers comprehensive learning disability and ADHD as sessment, and career assessment.

## SHAC Dental Services

Dental Services
University Center Building Suite 307
527 SW Hall Street
503-725-2611

## www.pdx.edu/health-couns eling/dental

Dental Services in the Center for Student Health \& 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 perterm may access Dental Services on a fee-for-service basis. All fees are billed to the student's account. There is no student dental insurance plan, however the cost ofservices is greatly reduced compared to those of a private dental clinic. Dental Services'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 if a student needs a specialist or more intensivedental treatment.

Some ofSHAC's dentalservices include:

- Routine \& emergency exams
- teeth cleaning
- x-rays
- fillings, crowns \& bridges
- oral surgery/wisdomteeth extraction
- custom whitening trays
- night guards \& sports guards
- root canals

Fora comprehensive list ofservices and fees go to our website.

## SHAC Health Promotion \& Education

Health Promotion \& Education University Center Building, Suite 307
527 SW Hall Street
503-725-5339

## www.pdx.e du/health-couns eling/wellness

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

Health Promotion \& 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 socialdeterminants of violence and to create equal 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, anti-oppression, consent workshops, and campus social norms.

The Wellness \& Health ActionTeam(WHAT), a group of studentpeer 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, which encompasses 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 studentorganization.

The Mind Spa, which students can reserveby appointment to relax, reduce stress, and learn new skills to reduce stress and anxiety. The Mind Spa includes a yoga space, fullbody massage chair, light therapy alcove, and a biofeedbackstation. There is also a VirtualMind Spa Experience that can be found online and accessed whenever needed at at
https://sites.google.com/pdx.edu/virtual-mindspa/home.

## SHAC Health Services

Health Services
University Center Building, Suite 200
1800 SW 6th Avenue
Suite 200
503-725-2800
www.pdx.edu/health-counseling/health
Health Services in the Center for Student Health \& Counseling (SHAC) is staffed by licensed, experienced healthcare providers, Registered Nurses (RN's), 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, women's health services, family planning counseling and contraception, x ray, immunizations, and student travel consultation. Health Services offers hormone replacement therapy (HRT) and trans medical services. Health Services has RN's trained and licensed to provide examinations and support for sexual assault survivors.

If a student has a health question or concern and Health

Services is closed, students can access a 24-hour External Nurse AdviceLine: 1-844-224-3145.

## Smith Memorial Student Union

Smith Memorial Student Union
1825 SW Broadway St.
503-725-2663
smsu@pdx.edu
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 smallest public bowling alley in Oregon.

Be inspired by Smith's student-run art galleries, relaxor study in the lounge spaces or find yourpeople in the many cultural centers. Studentres ources such as the Dean of StudentLife'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 als o home to PSU studentmedia, 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 BoxOffice
1825 SW Broadway
Suite 120 -- Smith Memorial Student Union
Broadway lobby
503-725-3307

The Univers ity Box Office at Portland State is the place to get event tickets, campus information and locker rentals (see also Locker Rentals). The boxoffice sells and dis tributes tickets for university and external events held at Portland State venues. This makes it yourstarting point for attending Lincoln Hallperformances, Viking Athletics events, commencement ceremonies, student-organized functions and cultural events. The Broadway lobby office in Smith also serves as thePSU 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 Peter W. 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-seatarena also hosts orientations, commencements and student events for the entire campus community. Regional corporate partners such as OHSU, TechFestNW andNike often use Viking Pavilion to host company evenings, banquets, trade hows and conferences. W eekdays, 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 ofSmith 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 Leaders hip Programs Smith Memorial Student Union Suite M1 13
1825 SW Broadway
Portland, OR 97201
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 engaged leaders on campus and in their larger communities. The following programs are supported by SALP:

Portland State Programming Board
Suite M1 10
1825 SW Broadway
Portland, Oregon 97201
(503) 725-5638
pdxprogramming@gmail.com
www.pdx.e du/s tudent-leaders hip/portland-s tate-programming-board
Portland State Programming Board promotes community, pride and tradition through student-initiated cross-campus events. PSPB plans free events to enhance the experience of all PSU students' campus life experiences such as the annual Portland State of Mind Concert, quarterly Midnight Breakfast and Mid-Term Stress Relief, and weekly Parkway North Project series including movies, concerts, and other fun activities.

## Student Government-ASPS U <br> Smith Memorial Student Union

Suite 117
1825 SW Broadway
Portland, Oregon 97201
(503) 725-8973
asps u@pdx.edu
www.pdx.e du/s tudent-government
Greetings fromthe Associated Students ofPortland 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 interest of students before internal and external bodies; facilitate formal needs of communication and interaction between students, student organizations, faculty and University administration; identify and develop services not offered by other divisions of the University; and provide a process fors tudents to fully participate in the allocation ofstudent incidental fees.

## Student Community Engagement Center Smith Memorial Student Union <br> Suite M1 02/103 <br> 1825 SW Broadway <br> Portland, Oregon 97201 <br> (503) 725-8132

volunteer@pdx.edu
www.pdx.edu/student-community-engagement
The Student Community EngagementCenter is the hub for studentcivic 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 <br> Smith Memorial Student Union <br> Sub-basement

1825 SW Broadway
Portland, Oregon 97201
(503) 725-5687
smedia@pdx.edu

## www.pdx.edu/student-media

StudentMedia is the home for Portland State's officially recognized student-run media organizations. Ouraim 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
Smith Memorial Student Union
Suite M1 13
1825 SW Broadway
Portland, Oregon 97201
(503)725-4452
asksalp@pdx.edu
www.pdx.edu/student-leadership
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 Avenue Cinema, Graphic Design Center, Littman + White Galleries, Portland State Professional Sound, and PSU Food Pantry.

## Student Organizations

Smith Memorial Student Union
Suite M1 19
1825 SW Broadway
Portland, Oregon 97201
(503) 725-4452
asksalp@pdx.edu
www.pdx.edu/student-leadership
SALP is home to close to 200 different student organizations 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 <br> Smith Memorial Student Union <br> Suite M1 04 <br> 1825 SW Broadway

## Portland, Oregon 97201

(503) 725-5598
psussc@pdx.edu
www.pdx.edu/student-sustainability-center

Explore sustainability, build community, and strengthen your resume. 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 Ambass ador Program

## www.pdx.edu/visit/s tudent-ambas s adors

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, administrators, 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 program is 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 StudentFinancial Aid and Scholarships assists 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
www.pdx.edu/sls/
StudentLegal Services (SLS) provides free confidential legalconsultations and representation to PSU students taking one or more undergraduate or graduatecredits and
paying student fees. SLS handles a wide range of legal issues 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 programforstudents interested in legal professions.

## Transportation and Parking Services

1812 SW 6th Ave, in the Academic \& StudentRecreation 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 togo 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, so it 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 for TriMet'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 all buildings on campus as a convenient, short-termparking option. PSU also provides a variety of indoorbike 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 s moothly with a visit to the PSU Bike Hub, an on-campus bike shop at the Student Rec 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 carsharing company, has over 20 vehicles available in the university dis trict. 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 Trans portation \&

Parking Services at 503-725-3442 or
vis it www.pdx.edu/transportation.

## TRIO Educational Talent Search

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 685 students fromgrades 6-12 in the Portland SchoolDistrict. The programmission is to identify, motivate, and assiststudents in their educational 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)
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 is Portland State University's federally funded academic and personal support services for college students. It is designed to provide special assis tance 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 assis tance, skill development workshops, study spaces, computer lab, writing ass is tance, and referrals that are designed to help the students achieve their educational goals.
TRIO - Student Support Services (SSS) S TEM 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 low-
income, who have a dis ability, or whoseparents did not graduate with a bachelor's degree can receive assistance from SSS STEM if they have a need for academic support. The programprovides academic counseling, financial literacy, scholarship assistance, skill development workshops, study spaces, computer lab, writing assistance, and referrals that are designed to help the students achieve their educational goals.

## TRiO Upward Bound

TRIO Upward Bound (UB)
1825 SW Broadway, M330
503-725-4458
www.pdx.edu/ubets
Upward Bound, a college preparation program for high 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 to improve students' academic and study skills in high school, to develop their career and educational plans, and to help thementer and succeed in higher education. Upward Bound serves low income, first generationhigh school students from the following school neighborhoods: Jefferson, Roosevelt, and McDaniel.

## University Market

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 gearcan be found in one on-campus location -- the Univers ity Market in Smith. The Market offers regular specials, friendly service and accepts cash, Visa, 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
campusvisits@pdx.edu
www.pdx.edu/visit/

The Univers ity Welcome Center welcomes prospective students and the community to Portland State University. The Univers ity Welcome Center oversees:

- Daily and group campus tours
- Admissions information sessions
- Large visit programs for prospective students
- Admis sions drop-in counseling for prospective students
- Student Ambassador Teamsupporting student recruitment and community outreach


## University Housing \& Residence Life

## University Housing \& Residence Life

The Broadway Building

## Suite 210

625 S W Jackson Street
Portland, OR 97201
503-725-4375
housing@pdx.edu
www.pdx.e du/housing
Univers ity 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 directstaff 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 current residents. 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 ResourceCenter

Smith Memorial Student Union

## Suite 401

503.725.9807
psuvrc@pdx.edu
www.pdx.edu/veterans-resource-center/
The mission of the Veterans Resource Center (VRC) is to support all military-connected students with their transition from the military to academe. We provide academic support, professional development, VSOC counseling, information dissemination and wholistic health outings. In addition, we work in partnership with PSU staff, faculty and adminis trators who seek to better understand the unique cultural differences found in the veteran community and how we can all work together cohesively and respectfully for the success of the community. The vision of the Veterans Resource Center is to foster a comprehensive systemof support for the students to enhance academic success to wards graduation, professional and personal development. In addition, we strive to cultivate an environment within the VRC that is
inclusive and engaging for all students: women, nonveterans, LGBTQ, and people of various racial/ethnic compositions and abilities.

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

## www.pdx.edu/womens-res ource-center

The Portland State University W omen's Res ource Center offers students of all genders a place for support, leadership development, and community building. Our Sexual \& Relationship Violence Response Program provides confidential advocacy for students experiencing stalking, sexualharassment, sexual as sault, and dating/domestic violence. OurLeadership 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 celebrates hared identities. We have a lounge space for studying and hanging out with comfortable seating, a kitchenette, and tea and coffee. Wealso offer menstrual products free of charge.

# Student Policies and Guidelines 

Reasonable Accommodation/Access Policy

PSU students with disabilities are provided with reasonable accommodations that givethemthe 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 disabilities reasonable accommodations, academic adjustments, 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 UnlawfulHarassment." PSU strives to maintain a climate that values diversity and exemplifies mutual respect. To that end, youare 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 orharassment, educates us about the risk of liability to Portland State University, its managers, and individual employees, and, in keeping with PSU's core values; promotes a climate of mutual respect.

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

Portland State University desires to create a safe campus for our students. As partof that mission, PSU requires all students to take the learning module entitled Creating a Safe Campus: Preventing GenderDiscrimination, Sexual Harassment, Sexual Misconduct and Sexual Assault.
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 regarding gender discrimination, sexual harassment, sexual mis conduct, sexual as sault, dating violence and domestic violence.

## Student Conduct

The Student Conduct and Community Standards Programadminis ters policies and regulations that help the Univers ity to operate in a climate of free inquiry and expression, and supports the academic and educational purposes of the University. Students should seek assistance fromthe 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 Responsibility. 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 Responsibility, which applies to all students, prohibits all forms of academic misconduct, 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 misconduct.

## 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 assessed a quarterly health insurance fee thatenrolls them in the PSU Student Health Insurance Plan. A student may waive out ofthe PSU-sponsored health insurance plan if they maintain personal health insurance that meets Univers ity criteria. For more information about the PSU studenthealth insurance waiver process, waiverdeadlines, or to review the benefits and rules of the PSU Student Health Insurance Plan, visit https://www.pdx.edu/healthcounseling/insurance.

## Office of

## International Affairs

Executive Director: Ron L. Witczak

Executive Assistant, Karin Waller
Karl Miller Center, Suite 610
503-725-4094
www.pdx.edu/international-affairs
The Office of International Affairs (OIA) provides support for international students, scholars and faculty, as well as PSU students and faculty who are planning to study, intern and teach abroad. OIA also houses Centers and Institutes which focus on specific geographic regions with the goal of promoting cultural understanding and engagement. In addition, our Portland Center and International Special Programs offer individualized programs for international students visiting the U.S.

## International Student and Scholar Services

## Director: Christina Luther

Associate Director: Jill Townley
Assistant Director: Jos hua Davis
Karl Miller Center, Suite 660
503-725-4094
oia@pdx.edu
International Student and Scholar Services staff work with admitted international students, visiting scholars, and international faculty. The office is a central source of information on the services and programs available to these groups. The staff work closely with sponsoring agencies, diplomatic missions, and other government agencies 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 adv is ing for students, visiting scholars, and exchange students.
- 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.
- Weekly or quarterly workshops on is sues affecting internationals, such as insurance, work permis sion, taxes, etc.
- A weekly International Coffee Hour open to allPSU students, staff, and faculty.
- Advising for faculty and staff regarding the invitation and employment of international faculty.
- Advising of international faculty (and their dependents) on regulations and procedures formaintaining legalstatus, travel, employment authorization, and other issues.

For more information aboutstaff and services, please visit our websites:
www.pdx.edu/international-students and www.pdx.edu/international-scholars.

For information about international student admissions, contact the Office of Admissions at 503-725-3511 or intladm@pdx.edu.

For information about English as a Second Language (ESL), contact the Intensive English Language Program, University Center Building Suite 400, 503-725-4088 or esl@pdx.edu.

## Education Abroad

Director: Jen Hamlow
jhamlow@pdx.edu
Karl Miller Center, 6th Floor
503-725-5309

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

PSU supports the long-standing value that studying other cultures and places is an essential component of modern education. 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. The University administers s ome of these programs directly, while others are conducted in cooperation with educational associations such as IE3 Global, the Council on International Educational Exchange (CIEE), and the University Studies Abroad Consortium (USAC).
Advisors in Education Abroad provide guidance and as sis tance 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 reg is tration, participating students who are eligible for financial aid at PSU may apply it, in most cases, to these study programs.

PSU also has a long-standing tradition of working with faculty to develop a variety of short-termoverseas experiences for students. The length of these programs ranges fromten days to sixweeks, and they are offered
throughout theacademic year. PSU faculty members have taken students to countries all over the world, including China, Costa Rica, Cuba, Ecuador, Ghana, India, Italy, Japan, Mexico, Nicaragua, Spain, and Vietnam.
Education Abroadopportunities 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 ouroffices on the 6th floor of the KarlMiller Center.

## International Special Programs

## Director: Jeff Baffaro <br> baffaroj@pdx.edu <br> Karl Miller Center, 630A

## 503-725-4181

## www.pdx.edu/intl-s pecial-programs

International Special Programs (ISP) provides non-credit short-term training and education programs for professional and student groups, custom-designed for specific international organizations/agencies/institutions, which draw on resources and expertise ofPSU 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.pdxedu/intl-special-programs.

## International Partnerships

Director: SallyS. Mudiamu
strand@pdx.edu
Karl Miller Center, 630D
503-725-5726
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-term special programs, education abroad for PSU students, collaborative online international learning, alumni involvement, private sector engagements, and scholarly exchange. Linking these opportunities togetherunder 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 staffto international opportunities. OIP also provides robust cultural and institutionalexpertise to PSU faculty, staff, and international partners seeking to navigate the complex internationaluniversity landscape.

## Portland Center

Director: Sally S. Mudiamu
Karl Miller Center, 630D
503-725-5728
strand@pdx.edu
www.pdx.edu/portland-center/
In Fall 2018, the Office of International Affairs launched the Portland Center to run programming and support for visiting, non-degree seeking international students at PSU. The Portland Center collaborates closely with the Intensive English Language Institute to offer language and academic support tostudents frompartner institutions wishing to take regular PSU undergraduate classes as part of their home baccalaureate degree. The programaccepts students fourtimes peryear on a rolling admissions basis and assist students with housing, regis tration 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 institutional partners and their students. It will offerPSU 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.

## Institute for Asian Studies

Director: Suwako Watanabe
suwako@pdx.edu
Karl Miller Center, 6th Floor
503-725-8575
asianstudies@pdx.edu
www.pdx.edu/asian-studies
The mission of the Institute for Asian Studies (IAS) is to promote understanding of the landscapes, his tories, 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 ofboth 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.

## Middle East Studies Center

## Director: Linds ay Benstead, PhD <br> benstead@pdx.edu <br> Outreach Coordinator: Corinne Hughes

cohughes@pdx.edu

## Karl Miller Center, 660R

503-725-4074
www.pdx.edu/middle-east-studies
The miss ion of the Middle EastStudies Center (MESC) is to serve ourstudents, city, and world through the creation 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 resourceon issues pertaining to the Middle East through activities thatreach students and scholars, as well as businesses, educators, and the media. In addition, the Centersupports academic conferences, workshops, cultural events, and lectures and provides support to 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 furtherseeks to guide and train students who planto 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 orMinor in Middle East Language with programs in Arabic, Persian, and Hebrew.*
Please take a look at the various activities of our center on our web page and consider becoming a friend of MESC.

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


## Fulbright, Boren \& Critical Language Scholarships

Director: Debra Z. Clemans<br>clemansd@pdx.edu<br>Assistant: Karin Waller<br>wallerk@pdx.edu

Karl Miller Center, Suite 610
https ://www.pdx.edu/fellowships/

## Fulbright Program

Portland State participates in the FulbrightProgram, 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, Res earch, or Teach Abroad - Fulbright opportunities for US students are announced annually on April 1 with submission 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 assists applicants throughout the application cycle. https://us.fulbrightonline.org/
University Lecturing and/or Advanced Research-The application deadline for many faculty and professional levelprograms is late summer each year. This program also sends non-US scholars and res earchers fromoverseas universities to the US. Visit https://www.cies.org/ or contactDebra Clemans to learn about how to invite a scholar fromoverseas to study, teach, or do research in your departmentat Portland State University.
Doctoral Dissertation Research Abroad - This FulbrightHays programprovides grants to colleges and universities to fund individual doctoral students 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 ifyou decide to apply.
Fulbright for Foreign Students - Fulbright offers awards to students fromoutside the US through embassies and Fulbright commissions 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 who can 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. Interv iews are held on the PSU campus prior to Boren deadlines. Those interested should contact the Boren director listed above for more information on requirements and application details and vis it https://borenawards.org/. Information sessions are available during fall term.

## 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/.

## 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 resources 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 South Park Blocks next to the Viking Pavilion, houses a large collection ofbooks, 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. SpecialCollections 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 workshops on library information and resources. Faculty can use the websiteto requestan instruction session for their class.
The Library encourages students to ask for help with research. Vis it the Library Research Center on the Library's second floor, call 503-725-2399, or contact us by chat, text, or email. Subject librarians are available to consult with faculty and students on in-depth research questions, theses, and dis sertations.
To check out materials, vis it 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. Branford's Bean, an onsite coffee cart on the first floor, is open during mostLibrary hours.
The Library's hours vary throughout the year. Vis it 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 program of study required of all students (notrequired 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 problem solving 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 themselves, each other, and their communities.
University Studies begins with Freshman Inquiry, a yearlong course introducing students to different modes of inquiry and providing themwith the tools to succeed in advanced studies and their majors. At the sophomore level, students choose three differentcourses, each of which leads into a thematically linked, interdisciplinary clusterof courses at the upper-division level. Students are required to complete 12 credits fromone ofthese clusters. Finally, all students are required to complete a capstone course which cons ists of teams of students from different majors working together to complete a projectaddressing an issue in the Portland metropolitan community.
University Studies courses transfer to other institutions. For more information or assistance visit the University Studies websitewww.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 threes mall-group, peer mentor sessions 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 thes ame. 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 in formation technologies. Students will also learn how disciplines from the sciences, socialsciences, humanities, and professional schools approach problems in different ways and how they work together to improve understanding of complexissues.
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/unst) or online schedule of courses for course descriptions.
At the sophomore level, students complete 12 credits of coursework in Sophomore Inquiry. Students select three Sophomore Inquiry classes. Sophomore Inquiry classes are structured similarly to those in Freshman Inquiry with a main class and smaller mentor inquiry workshops, except at this level the mentor classes are led by graduate students. Mentor inquiry workshops focus on weekly learning modules on study skills, writing, technology training, group dynamics, ePortfolio presentation and 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, the diversity of human experience, and ethics and social responsibility. 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.

## Upper-Division Cluster

See the University Studies Program website (www.pdx.edu/unst) for descriptions of upper-division clusters and lists of approved cluster courses.
After their Sophomore Inquiry coursework, students select one of three clusters represented in their Sophomore

Inquiry classes. Froma list of courses approved for the selected cluster, students pursue a programof 12 upperdivis ion credits offered by various departments across campus. These classes allow students to explore an aspect of the cluster's theme in greater depth, while continuing to investigate the four University Studies goals in relation to the cluster topic.
Students might choose a cluster to broaden their perspective, allowing them the 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 not be used to fulfill a student's major requirement. In addition, students cannot take cluster courses in their major or cours es cross listed with their majors.
Beginning Fall 2020, the Registrars Office will begin transcripting Junior Cluster Courses.

## Senior Capstone

See the University Studies Program website (www.capstone.unst.pdx.edu) for course descriptions.
The culmination of the University Studies programis the Capstone 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 fromthe 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 enhancestudent 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<br>Barbara Heilmair, Associate Dean<br>Lincoln Hall 349<br>503-725-3105<br>www.pdx.edu/arts

- B.A., B.S.-Architecture, Art History, Film, Mus ic Performance, Music Theory, Musicology/Ethnomusicology, Sonic Arts andMusic Production, Theater Arts
- B.F.A.-Art Practice, Graphic Design
- B.M.-Composition, Jazz Studies, Music Education, Performance, Performance with an Emphasis 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 InterestDes ign
- 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 ofthe Arts prepares talented students for creative careers and lifelong enrichment through intellectual dis covery 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 interdisciplinary 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 dis trict. Within blocks of the College, theaters, galleries, professional studios, and design and architectural firms provide a stimulatingenvironment in which ourstudents 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.pdxedu/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 admission to PSU.
-Have one copy of their transcripts sent to the Office of Admissions.
-Apply for programadmission to the Schoolof choice (including, if requested, onecopy oftheir transcripts sent to the School of their choice).
Please see individual School websites for more specific admissions 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 and else where in this Bulletin:
Undergraduate residents $\$ 11.40$ per credit hour
Undergraduate non-residents $\$ 46.00$ per credit hour
Graduate residents $\$ 47.00$ per credit hour
Graduate non-residents $\$ 51.00$ percredit 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 charged COTA differential tuition unless the second major is in another College or program also charging differential tuition (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 program from 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 recordso 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 termprior to the term in 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 programdevelops the creative 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 program resides in the architecture design studio and is nouris hed by the accompanying 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 issues and technologies of sustainable urban living and environmental stewardship.
In giving place to human situations architecture bears the responsibility ofbeing the most public of the arts and it cannotbe 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 oururban cohabitants, including direct interaction with the architectural practice community through our adjunct professors, critics, guest speakers and advisers. This fosters the generation of imaginative responses to the challenge of 'what oughtto be' in the context of 'what is'.
The educational emphasis of the programencourages students to recognize the value of creative engagement 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 placethrough 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 licensure, 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 thes tudy of architecture at the undergraduate level in the context of a broad and enriching liberal arts education. It is important to understand theplace 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 liberalarts 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 Introduction to Environmental 4
Arch $120 \quad$ Visual Communication $1 \quad 4$
Arch 121 Visual Communication $2 \quad 4$
Arch 230 Architecture and Cultural 4 History I
Arch 231 Architecture and Cultural History II
Arch 232 Architecture and Cultural

## History III

Arch 280 Design Fundamentals Studio 1
Arch 281 Design Fundamentals Studio $2 \quad 6$
Arch 360
Building Tectonics 1
Arch 361
Building Tectonics 2
Arch 362
Building Tectonics 3
Arch 380
Architectural Design Studio 1
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 Architectural Design Studio 5
Arch 482 Architectural Design Studio $6 \quad 6$
Arch
3xx/4xx
Architectural Upper-Division Elective

Admission to the professional track and junior level Architecture Design Studios ( 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 programofstudy. 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 classes used to satisfy the major must be graded C - orhigher. 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 Architecture reserves the right to retain permanently for archival orexhibition purposes any studentwork executed as part of 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 systemwill provide critical advantages in your progress through the Architecture program, especially the ability to work in any ofour 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 soft ware 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 currentlysuspended and notaccepting 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 <br> BA 101 | Introductionto Business and <br> World Affairs | 4 |
| :---: | :--- | :---: |
| BA 205 | Business Communications Using <br> Technology | 4 |
| BA 211 | Fundamentals ofFinancial <br> Accounting | 4 |
| Stat 243 | Introductionto Probability and | 4 |
| Arch 100 | Statistics I <br> Introductionto Architecture | 4 |
| Arch 280 | Design Fundamentals Studio 1 <br> Arch 281 | Design Fundamentals Studio 2 <br> Arch 360 |
| Auilding Tectonics 1 | 6 |  |
| Arch 361 | Building Tectonics 2 <br> Arch 425 | ComputationalDesign \& Digital <br> Making I |
| Arch 426 | ComputationalDesign \& Digital <br> Making II | 4 |
| Subtotal: 88 | Ma |  |

## 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 takenunder 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 significanturban 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 dis cursive 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 InterestDesign consisting of cours ework 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-year 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 semester credits) of general education 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 basedupon satis faction of the ins titutional requirements together with competitive application. Submission materials includea 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 on evidence 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
$\begin{array}{lll}\text { Arch 530 } & \begin{array}{l}\text { Contemporary Architectural } \\ \text { Theory }\end{array} & 4 \\ \text { Arch 53x } & \text { Architectural Theory Elective } & 4 \\ \text { Arch 540 } & \text { Professional Practice } & 4 \\ \text { Arch 54x } & \text { Professional Practice Elective } & 4 \\ \text { Arch 560 } & \text { Advanced Architectural } & 4 \\ & \text { Technology } & \\ \text { Arch 580 } & \text { Architectural Design Studio 7 } & 6 \\ \text { Arch 581 } & \text { Architectural Design Studio 8 } & 6 \\ \text { Arch 582 } & \text { Architectural Design Studio 9 } & 6 \\ \text { Arch 511 } & \text { Pro-Thesis Seminar } & 4 \\ \text { Arch 584 } & \text { Design Development Studio } & 6 \\ \text { Arch 585 } & \text { Design Thesis } & 6\end{array}$
Arch 540
Arch 54x
Arch 560

Arch 580
Arch 581
Arch 582
Arch 511
Arch 584
Arch 585

Arch 586 Integrated Systems 6 5xx Special InterestElectives 14
Subtotal: 74
The Master of A rchitecture programis designed for students intending to become licensed architects and has full profess ional 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 licensure. 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 program in 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 res erves 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 systemwill provide critical advantages in your progress through the Architecture program, especially 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 systemspecifications published by the School, including software required for courses in our program. Contact the Schooloffice for complete information on our Student 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 4
Arch 536 Architectural History and Theory 4 I
Arch 537 Architectural History and Theory 4
Arch 538 Architectural History and Theory 4 III
Arch 539 Architectural History and Theory 4 IV
Arch 567 Architectural Structures 4
Arch 568 Architectural Technology I 4
Arch 569 Architectural Technology II 4
Arch 564 Architectural Technology III 4
Arch $570 \quad$ Architectural Design Transition 6 Studio I
Arch 571 Architectural Design Transition 6
Studio II
Arch 572 Architectural Design Transition 6
Studio III
Arch 573 Architectural Design Transition 6
Studio IV

Subtotal: 60

## PUBLIC INTEREST DESIGN GRADUATE CERTIFICATE

## DEGREE REQUIREMENTS

The courseofstudy 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. Fieldwork 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 practicum working 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 realm of public interestdesignand how it can informtheir careers going forward.

## COURSEWORK

## Core Requirements

$\begin{array}{lll}\text { Arch } 533 & \begin{array}{l}\text { Contemporary Issues Seminar- } \\ \text { Public Interest Design in Practice }\end{array} & 4\end{array}$
Arch 541 Practicum- Public Interest
Design Fieldwork

## Subtotal: 8

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


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 have broughtnew interest and attention to urban design.
What is Urban Design? The termgenerally 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 aesthetic and three-dimensional designskills of the architect with the decision-making, engagement, and management methodologies of the urbanplanner. What excites the urban designer is the making of memorable and artfulplaces - 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 Univers ity, 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 their own 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 urban design 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 20-22 SCH (course descriptions can be found in the PSU Bulletin).

## Core Requirements

Theory

USP 513
Methods
Arch 521
Practice
USP 575

Arch 532 History and Theory of Urban 4
Design

Urban Design Methods
Urban Design Workshop

Arch 531 Studies in Contemporary Urban
M.Arch candidates only may substitute Arch 585 Design Thesis ( 6 credits) with an urban design topic for USP 575. Subtotal: 20-22

## Application and Admission Requirements

Admission to the Graduate Certificate 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 ofevidence 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 university graduate admis sion standards. Typically, students admitted to graduate study at Portland State have an undergraduate 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 registered 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.

## Course Overlap Between Degrees and Certificates

Graduate courses can be applied to a master's (ora doctoral) degree and a graduate certificate. However, graduate courses cannot be applied to two graduate certificates. See PSU Bulletin for more course overlap information.

## 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 history, 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 instructional 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 thesequence 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 webs ite for further information.

## ART MAJOR AND MINOR DEGREE REQUIREMENTS

All students entering the CORE Programare 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 history is a flexible degree that prepares students for a range ofjobs 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 | Introductionto 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, ArH 410, 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 Credit Hours: 66

ART PRACTICE—B.F.A.

The BFA in Art Practice is a professional 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

100-Level Courses

| ArH 106 | Introductionto VisualLiteracy | 2 |
| :--- | :--- | :--- |
| 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 |

Subtotal: 25

## 200-Level Courses

| ArH204 | Art History: The Ancient W orld or |  |
| :---: | :---: | :---: |
| ArH205 | Art History:The Medieval World | 4 |
| ArH206 | Art History: The Modern World | 4 |
|  | Choose four ofthe following 4credit courses ( 16 credits total): |  |
| ArH291 | History of Animation | 4 |
| Art 227 | Introductionto Art and Social | 4 |
|  | Practices |  |
| Art 250 | Life Drawing I | 4 |
| Art 255 | Two-dimensional Animation I | 4 |
| Art 256 | Three-dimensional Animation I | 4 |
| Art 257 | Introductionto Video Art | 4 |
| Art 260 | Black and White Photography | 4 |
| Art 261 | Digital Photography | 4 |
| Art 270 | Introduction to Printmaking: | 4 |
|  | Relief |  |
| Art 271 | Introduction to Printmaking: |  |
|  | Etching |  |
| Art 281 | Intro to Painting | 4 |
| Art 282 | Painting Topics | 4 |
| Art 291 | Introductionto Sculpture | 4 |
| Art 292 | Introductory Sculpture Topics | 4 |
| Art 294 | Water Media | 4 |
| Art 296 | Digital Drawing, Painting and | 4 |
|  | Printmaking |  |
| Art 297 | Book Arts | 4 |

Subtotal: 24
300-Level Courses

| ArH384 | or |  |
| :---: | :---: | :---: |
|  | Western Art in the 20th Century or | 4 |
| ArH385 | Western Art in the 20th Century | 4 |
| Art 303 | Making and Meaning | 4 |
| Art 330 | Critical Theories in Art I or | 4 |
| ArH398 | Contemporary Art | 4 |
| Art 336 | BFA: Research and Proposal | 4 |
| Art 339 | BFA Vertical Lab I: | 4 |
|  | Collaboration and Presentation Strategies |  |
|  | Choose four of the following 4credit courses ( 16 credits total): |  |
| Art 312 | Art in the Elementary School | 4 |
| Art 327 | Intermediate Art and Social Practices |  |
|  |  |  |
| Art 350 | Life Drawing II | 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 365 | Artists |  |
| Art 370 | Topics in Printmaking Techniques |  |
| Art 371 | Intermediate Printmaking | 4 |
| Art 373 | Intermediate Sculpture | 4 |
| Art 374 | Intermediate Sculpture Topics | 4 |
| Art 391 | Intermediate Drawing and Mixed Media |  |
| Art 392 | Intermediate Painting | 4 |
| Art 393 | Painting Topics | 4 |
|  | Subtotal: 36 |  |
| 400-Level Courses |  |  |
| ArH 407 | Seminar | 0-12 |
|  | or |  |
| ArH 449 | Art History Methods | 4 |
| Art 439 | BFA Vertical Lab II: | 4 |
|  | Collaboration and Presentation Strategies |  |
| Art 485 | Professional Practices for Artists | 2 |
| Art 496 | BFA ProjectI | 4 |
| Art 498 | BFA Project II | 4 |
| Art 499 | BFA Oral Review | 2 |
|  | Choose three of the following 4credit courses ( 12 credits total): |  |


| Art 427 | Advanced Art and Social Practices | 4 |
| :---: | :---: | :---: |
| Art 450 | Life Drawing III | 4 |
| Art 455 | Time-Based Art Studio | 4 |
| Art 457 | Low Tech Cinema | 4 |
| Art 461 | Advanced Photography Studio | 4 |
| Art 462 | Professional Practices in Photography | 4 |
| Art 479 | Advanced Printmaking Working Place | 4 |
| Art 490 | Advanced Painting | 4 |
| Art 491 | Advanced Painting Topics | 4 |
| Art 493 | Advanced Drawing Mixed Media | 4 |
| Art 494 | Advanced Sculpture | 4 |
| Art 495 | Advanced Sculpture Topics | 4 |
| Art 497 | A History of Art and Social Practice | 4 |

Subtotal: 32

## Total Credit Hours: 117

CULTURAL HISTORY OF THE ARTS B.A./B.S.

This innovative flexible degree allows students to study the histories of music and art across cultures and time. We explore the important ways cultural history both reflects and shapes society, and by incorporating both musical and art history these connections can be made even more deeper and more nuanced ways.
The B.A. or B.S. in CulturalHistory requires 60 credit hours total, of which:
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 allstudents 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 levelcourses 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 | Introduction to Visual Literacy | 2 |
| :--- | :--- | :--- |
| ArH204 | Art History: The AncientWorld | 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 | Medieval Monsters | 4 |
| ArH 356U | Early Medieval Art and Architecture | 4 |
| ArH 357U | Byzantine Art and Architecture | 4 |
| ArH 358U | Medicine and Magic in Romanesque Art | 4 |
| ArH 359U | Gothic Art and Architecture | 4 |
| ArH 360U | The Art of War: Representing the Crusades | 4 |
| ArH381U | 19th Century Art | 4 |
| ArH 382U | 19th Century Art | 4 |
| ArH383 | Western Art in the 20th Century | 4 |
| ArH 384 | 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 |
| ArH 415U | Issues in Asian Art | 4 |
| ArH 426U | African Art | 4 |
| ArH | Women in the Visual Arts | 4 |
| 431U/WS |  |  |
| 431U |  |  |
| ArH 432U | Issues in Gender and Art | 4 |
| Des 290 | History ofModern Design | 4 |
| Mus 105 | Introduction to 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 Our Music, Then and Now | 4 |
| Mus 360U | The Guitar: its History and Music | 4 |
| Mus 361U | History ofRock 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 History and <br> Music | 4 |
| :--- | :--- | ---: |
| Mus 369U | Music and Social Change | 4 |
| Mus 374U | World Music: Africa and the | 4 |
| Mus 376U | Middle East | American Musical Traditions |$\quad 4$

Note that other upper level architectural, art, film and mus ic history classes offered at PSU might be applied to this degree, if you get prior approval fromthe Cultural History 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. Visit 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 thereview 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
http://www.pdx.edu/art-design/sites/www.pdx.edu.artdesign/files/PSUGD_LaptopGuide_16_17.pdf.

## DEGREE REQUIREMENTS

## 100-Level Courses

| Des 111 | Design Thinking | 4 |
| :--- | :--- | :--- |
| Des 120 | Digital Graphics | 4 |
| Des 121 | Introductionto Type and Design | 4 |
|  | Principles |  |
| Des 125 | Show and Tell | 1 |
| Des 140 | Foundations in Motion, UI, and | 4 |
|  | UX |  |

## 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 | History of Modern Design | 4 |
| ArH2XX | Any 200-level Art History Class | 4 |

Subtotal: 28

| Sophomore Portfolio Review |  |  |
| :--- | :--- | :--- |
| 300 \& 400-Level RequiredCours es |  |  |
| 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 | 28 |
| 3XX/Des |  |
| 4XX |  |

Subtotal: 28
Total Credit Hours: 107

## ART HISTORY—CERTIFICATE

The Certificate in Art History offers theopportunity for students who have already completed a B.A. or B.S. to undertake an in-depth study in art history through a curriculum centered in small discussion-based seminars and other upper-level coursework.

## DEGREE REQUIREMENTS

Students who have not already taken the 200-level art history survey sequence or its equivalent els ewhere are encouraged to do so before undertaking the postbaccalaureate certificateupper-level coursework:

| ArH 407 | Seminar | $0-12$ |
| :--- | :--- | ---: |
| ArH 449 | 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 W orld | 4 |
| ArH205 | Art History: The Medieval | 4 |
|  | World |  |
| ArH 206 | Art History: The Modern W orld | 4 |

Subtotal: 8

| One of the following: |  |  |
| :--- | :--- | :--- |
| ArH 106 | Introduction to Visual Literacy | 2 |
| Art 104 | CORE: Digital Tools | 2 |

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

## MINOR IN ART PRACTICE

This minor is des igned 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 | History of Modern 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 | 4 |
|  | Principles |  |
| Des 120 | Digital Graphics <br> Des 200 | Digital Page Design I <br> Des 224 |
| Storytelling and Narrative | 4 |  |
| Des 367 | Design Business Practices <br> or | 4 |
| Des 340 | Interaction Design Principles | 4 |

Total Credit Hours: 24
MINOR IN GRAPHIC DESIGN

Des $290 \quad 4$
Des 120 Digital Graphics 4
Des 121 Introductionto Type and Design 4
Principles

| 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-res idency 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 his tory 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

W orking 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 admission to the university and continue work to wards their degree. (Students in-residency receive a candidacy review at the end of their first year; flexible-res idency 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 ofArt+Design)
- 12 credits Graduate Seminars
- 6 credits Exhibition Project/Statement

Upon successful completion 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-s chool levelshould complete a bachelor's degree in Art or prescribed art foundation/history 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 licensure 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 Commission's requirements in force at the time of the licensure application. Please refer to the College of Education requirements (p. 146).

## 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 BachelorofArts/Bachelor ofSciences in Film is designed to offer students the opportunity to major in a diverse film curriculum that 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 ofFilm 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; critical thinking; 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 Analysis |
| FILM 132 | Introduction to Digital |
|  | Filmmaking |
| FILM 231 | Film Analysis II |
| FILM 280 | ClassicalFilm Theory |
| FILM 381 | Film History I |
| FILM 382 | Film History II |
| FILM 383 | Film History III |
| FILM 480 | Contemporary Film Theory |

## Critical and Theoretical Practices ( 16 credits)

Choice of 16 credits fromthe following:
FILM 257 Narrative Film Production I
FILM 258 Documentary Film Production I 4
FILM 358 Narrative Film Production II
FILM 359 Narrative Film Production III
FILM 360 Topics in Film Production
FILM 361 Documentary Film Production II
FILM 362 Documentary Film Production III
FILM 363 Topics in ExperimentalFilm and 4 Media Production
FILM 364 Sound:Production and Design
FILM 365 Editing
FILM 366 Digital Cinematography
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 $356 \quad$ Visual Storytelling
Art 357 Intermediate Video 4
Art 455 Time-Based Art Studio 4
Wr416 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 $410 \quad$ Selected Studies 1-6
FILM $450 \quad$ Portfolio and Profes sional 4
Development
FILM 451 Advanced Production W orkshop 4
FILM 460 Advanced Topics in Production 4
FILM 484 Anatomy of Movie 4
FILM 486 Topics in Film and the Moving 4
Image
FILM 487 Topics in International Film and 4
the Moving Image
International Cinemas ( 8 credits)
FILM 487 Topics in International Film and 4
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 advisors.
Film Curriculum Electives ( 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 satis fy 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 upper-
division courses.
At least 16 credits of upper-division major courses must be
taken in residenceat Portland State University.
FILM STUDIES MINOR

## REQUIREMENTS

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

## Courses

| FILM 131 | Film Analysis | 4 |
| :--- | :--- | ---: |
| Eng 304 | Critical Theory of Cinema | 4 |
|  | 20 elective credits fromthe Film | 20 | 20 elective credits from the Film

Courses taken under the undifferentiated grading option (pass/no pass) will not be accepted toward fulfilling department minor requirements. All courses forthe minor must receive a grade of Cor above.
At least 16 credits of film studies courses mustbe 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 advis 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, Jazz Studies, 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, Jazz Studies, and Performance
- Graduate Certificate in Music Performance


## Mission statement

The Schoolof Music \& Theater provides professional training and liberal arts-basededucation to a highly diverse student body. Our primary goal is to generate and sustain an environment of creative inspiration and excellence in creation, practice, and appreciation of the performing arts. Framed by the University's motto "Let KnowledgeServe the City," the School presents a wide spectrum of activities
by students, faculty, and guestartists which enhance the artistic and cultural life of the city of Portland.

We offer a comprehensive array of options for emerging artists, with ten distinct undergraduate degrees including five professional options and four distinct graduate programs. Our dedicated faculty are internationally recognized performers, conductors, composers, directors, playwrights, designers, and scholars. The School embraces the dual goals of open access and outstanding achievement to producegraduates who make a significant impact in the performing arts regionally and beyond.

## 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 JazzOrchestra, Portland Piano International, Portland Youth Philharmonic, ChamberMusic Northwest, Oregon Repertory Singers, Artists Repertory Theater, Portland Center Stage, 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. Standards are high as students pursue the conservatory-like Bachelor ofMusic degreeor 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 Northwestandelsewhere.
Programs in the SchoolofMusic \& 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 anduniversity professors; and they have pursued a range of related professions in the arts, education, business, administration, law, social services, and non-profit management.

## DEGREE MAPS AND LEARNING OUTCOMES

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

Admission to the School is based on general admission to the University. (See "Admission requirements (p.8)" for more information.) Additionally, students seeking a B.A./B.S., B.M., orminor in Music (except forthe 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 Mus ic \& Theater website for application and audition requirements and deadlines.

## DEGREE REQUIREMENTS

All courses used to satis fy the School of Music \& Theater major and minor requirements, whether taken in the School or els ewhere, mustbe graded C or above. Courses taken under the undifferentiated grading option (pass/no pass) will not be accepted toward fulfilling department major requirements. Seventy-two (72) upper-divis ion 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 upperdivision 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 emphasis 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 completea final research project. Students successfully completing the B.A. or B.S. in Music:Musicology/Ethnomusicology will have gained the necessary skills in musicology and supportive curriculum to 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 music-related fields andoccupations.

## 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
Mup 290 Applied Music

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 1
Mus $115 \quad$ Sight Singing/Ear Training II $\quad 1$
Mus $116 \quad$ Sight Singing/Ear Training III $\quad 1$
Mus 188 Performance Attendance 0
( 9 terms required)
Mus 194 ChamberMusic 1
Mus 195, Large Ensemble: Band, 5
196, 197, or Orchestra, Choir, or Jazz Lab
198
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 $214 \quad$ Sight Singing/Ear Training IV 1
Mus $215 \quad$ Sight Singing/Ear Training V $\quad 1$
Mus 216 Sight Singing/Ear Training VI 1
Mus 304 Music History:Medieval, 4
Mus 305 Music History:Classical and 4
Mus 306 Music History: 20th Century 4
Mus 411 Topics in Music History 2
Two of the following ( 8 credits)
Mus 374U World Music: A frica and the 4 Middle East
Mus 375U World Music: Asia 4
Mus 376U American Musical Traditions 4
Mus 377U World Music:Latin America and 4
the Caribbean
Upper-division music electives to be chosen by studentin consultation with an advisor
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 termoftheir 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 completea final analytical or creative project. Students successfully completing the B.A. or B.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
Mup 290
Applied Music

Piano Proficiency Exam
Mus 047 Final Project
Mus 111 Music Theory I
Mus 112 Music Theory II
Mus 113
Mus 114
Music Theory III
Mus 115 Sight Singing/Ear Training II
Mus 116 SightSinging/Ear Training III
Mus 188 Performance Attendance (9 terms required)
Mus 194 Small Ensemble
Mus 195, Large Ensemble:Band,
196, 197, or Orchestra, Choir, or Jazz Lab
198
Mus 205 Listening I
Mus 206 Listening II
Mus 211 Music Theory IV
Mus 212 Music Theory V
Mus 213 Music Theory VI
Mus 214 Sight Singing/Ear Training IV
Mus 215 Sight Singing/ Ear Training V
Mus 216 SightSinging/Ear Training VI
Mus 304 Music History:Medieval, Renaissance, and Baroque
Mus 305 Music History: Classical and Romantic
Mus 306 Music History: 20th Century

Mus 311 Formal Analysis 3
Mus 312 Orchestration 3
Mus 313 Counterpoint 3
Mus 421 Analysis of Contemporary Music 3 or
Mus 422 AnalyticalTechniques
Upper-division music electives to
be chosen by student in
consultation with an advisor
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 oftheir analytical work for admittance to the major after completing Music Theory II or upon transferring to PSU. Students mustmeet GPA requirement of 3.0 and minimum grades ofB 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 analys is of a composition or 2) Performance of a composition transcribed fromone medium to 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 necessary skills in music performance and supportive curriculum to prepare themfor continued academic study in the dis cipline, along with the breadth of knowledge, critical thinking and expressive skills that can betranslated to a wide variety of music-related fields and occupations.

## REQUIREMENTS

In addition to meeting the general University degree requirements, music majors seeking theB.A. or B.S. in Performance must complete the following courses:

## Courses

Mup 190 Applied Music 3

Mup 290 Applied Music 3

| $\begin{aligned} & \text { Mup } 390 \text { or } \\ & 490 \end{aligned}$ | Applied Music | 6 |
| :---: | :---: | :---: |
| Mus 046 | Piano Proficiency Exam | 0 |
| Mus 047 | Final Project | 0 |
|  | or |  |
| 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/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 | 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, 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 | ChamberMusic | 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 mustcompletea 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 creativecontexts 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 curriculumto 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. or B.S. in Sonic Arts and Music Production must complete the following courses:

| Courses |  |  |
| :---: | :---: | :---: |
| Mus 045 | Portfolio Review | 0 |
| Mus 101 | Contemporary Music Theory I | 4 |
| Mus 102 | Contemporary Music Theory II | 4 |
| Mus 103 | Contemporary Music Theory III | 4 |
| Mus 188 | Performance Attendance (6 terms required) | 0 |
| Mus 191 | Group Les sons for Beginners I: Piano, Guitar or Voice | 2 |
| Mus 192 | Group Lessons for Beginners II: Piano, Guitar or Voice | 2 |
| Mus 193 | Group Lessons for Beginners III: Piano, Guitar or Voice | 2 |
| Mus 194, 195, 196, 197, or 198 | Small or Large Ensemble | 3 |
| Mus 145 | Music Technology Lab (3 terms required) | 1 |
| Mus 245 | SAMP I: Audio Recording | 3 |
| Mus 246 | SAMP II: Studio Techniques | 3 |
| Mus 247 | SAMP III: Studio Production | 3 |
| Mus 344 | Sonic Arts and Music Production Laptop Ensemble <br> (3 terms required) | 1 |
| Mus 345 | SAMP IV: Acoustics for Musicians | 3 |


| Mus 346 | SAMP V: Music with Visual <br> Media |
| :--- | :--- |
| Mus 347 | SAMPVI: Integrated Sound Arts <br> Mus 445 <br> Mus 476 |
| Business of Music <br> Computer Music Composition |  |
| Two of the following (8 credits) |  |
| Mus 301U | Survey of Music Literature I: <br> Medieval to ClassicalEra <br> Mus 302U |
|  | Survey of Music Literature II: <br> Romantic to Modern Era |
| Mus 355U | Jazz History |
| Mus 365U | Film Music <br> Mus 374U <br> World Music: A frica and the |
| Mus 375U | Middle East <br> World Music: Asia <br> Mus 376U |
| American Musical Traditions <br> Mus 377U <br> World Music: Latin America and <br> the Caribbean |  |
|  | Upper-division music electives |
|  | to be chosen bystudent in <br> consultation with an advisor. |3

Mus 445 Business of Music 3
Mus 476 Computer Music Composition 3
Two of the following (8 credits)
Mus 301U Survey of Music Literature I:
Mus 302U Survey of Music Literature II: 4
Mus 355U Jazz History 4
Mus 365U Film Music 4
Mus 374U World Music: A frica and the 4
Mus 375U World Music: Asia
Mus 376U American Musical Traditions

## Subtotal: 66

Interested 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 criticism, 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
TA 112 Stagecraft II 3
TA 114 Technical Theater Production I 1
TA 115 Technical Theater Production II 1

| TA 121 | Introduction to Design for 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 | Developmentof 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 | Theater History: Periods and Topics | 1-4 |
| TA 472 | Theater History: MajorFigures | 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 Production 3 |  |
| TA 335 | Workshop Theater: | 1 |
|  | Management/Publicity |  |

with a maximum of 3 credits in any of the 300 workshops. W orkshop credits in excess of this maximum may be used to satisfy elective and general requirements.

## 20 credits of the Theater Electives

20 elective credits from the 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 departmentmajor requirements. All courses used to satisfy the major requirements mustbe 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 emphasis in music composition, the B.M. in Composition provides a thorough music foundation with specialized coursework in composition, analysis, orchestration, counterpoint, and computer music. Students receive individualized instruction in composition les sons 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 them for 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:

| Cours es |  |  |
| :--- | :--- | :--- |
| 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 |  |
|  | (30 minutes minimum) | 0 |
| Mus 049 | Senior Recital |  |
|  | (30 minutes minimum) | 0 |
| Mus 111 | Music Theory I |  |
| Mus 112 | Music Theory II | 3 |
| Mus 113 | Music Theory III | 3 |
| Mus 114 | Sight Singing/Ear Training I | 3 |
| Mus 115 | Sight Singing/Ear Training II | 1 |
| Mus 116 | Sight Singing/Ear Training III | 1 |
| Mus 188 | Performance Attendance | 1 |
| Mus 195, | (9 terms required) | 0 |
| 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 | 1 |
| Mus 212 | Music Theory V | 3 |
| Mus 213 | Music Theory VI | 3 |
| Mus 214 | Sight Singing/Ear Training IV | 3 |
| 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 |
|  |  |  |

Mup 190
Mup 290
Mup 490
Mus 046
Mus 048

Mus 049
Mus 111
Mus 112 Music Theory II 3

Mus 113 Music Theory III
Mus 114 Sight Singing/Ear Training I
Mus 116 SightSinging/EarTraining III
Mus 116 Sight Singing/Ear Training III ( 9 terms required)
Mus 195, Large Ensemble:Band,

Mus 206 Listening II 1
Mus 211 Music Theory IV 3
Mus $212 \quad 3$
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
Composition I
Mus 242 Composition III 2
Mus 291 Advanced Class Piano I 2
Mus 292 Advanced Class Piano II
Mus 293 Advanced Class Piano III

Mus 304 Music History: Medieval, 4
Renais sance, and Baroque
Mus 305 Music History: Classical and 4
Romantic
Mus 306 Music History: 20th Century 4
Mus 311 Formal Analysis 3
Mus $312 \quad$ Orchestration 3
Mus 313 Counterpoint 3
Mus 320 Fundamentals ofConducting 2
Mus 394, Large or Small Ensemble 2
395, 396,
397 , or 398
Mus $394 \quad 1$
Mus 411 Topics in Music History 2
Mus 421 Analysis of Contemporary Music 3
Mus 474 or MidiApplications 2
475
Mus 476 Computer Music Composition 3
One of the following:
Mus 374U World Music: Africa and the 4
Mus 375U World Music:Asia 4
Mus 377U World Music:Latin America and 4
the Caribbean
Music electives to be chosen by
student in consultation with an advisor

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 therelated 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 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 Chamber Music 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 emphasis 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 necessary 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
Mup 290
Mup 390
Mup 490
Mus 046 Piano Proficiency Exam
Mus 048
Mus 049
Mus 111
Mus 112
Mus 113
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
( 9 terms required)
Mus 198
Mus 205
Jazz Lab Band
Mus 206 Listening II
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/ EarTraining V 1
Mus $216 \quad$ Sight Singing/Ear Training VI 1
Mus 271 Jazz Improvisation I 2
Mus $272 \quad$ 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
(Jazz section)

| Mus 304 | Music History: Medieval, Renaiss ance, 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: A frica and the Middle East | 4 |
| Mus 375U | or <br> World Music• Asia | 4 |
|  | or |  |
| Mus 377U | World Music: Latin America and the Caribbean | 4 |
| Mus 394 | Chamber Music | 6 |
| Mus 398 | Jazz Lab Band | 6 |
| Mus 411 | Topics in Music History | 2 |
| Mus 424 | Instrumental Jazz Arranging I | 2 |
| Mus 425 | Instrumental Jazz Arranging II | 2 |
| Mus 426 | Instrumental Jazz Arrang ing III | 2 |
| Mus 471 | Advanced Jazz Improvisation I | 2 |
| Mus 472 | Advanced Jazz Improvisation 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 therelated 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 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 mus ic with an emphasis in music education, the B.M. in Music

Education provides a thorough music foundation with specialized coursework in instrumental and vocal methods, conducting, rehearsal techniques, orchestration, and literature. Students train to become mus ic teachers in the K-12 setting and choose between our choraland instrumental mus ic 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 |
| 490 |  |  |
| 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, | 4 |
| Mus 305 | Music History: Classical and Romantic | 4 |
| Mus 306 | Music History: 20th Century | 4 |
| Mus 312 | Orchestration | 3 |

Mus $320 \quad$ Fundamentals of Conducting 2
Mus 321 InstrumentalConducting 2
Mus $322 \quad 2$
MuEd 328 Introduction to 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
Mus 409 Practicum 2
Mus $411 \quad$ Topics in Music History 2
Mus 474 MidiApplications 2
MuEd 484 Music with Children 3
One of the following:

| Mus 374U | World Music: Africa and the | 4 |
| :--- | :--- | :--- |
| Mus 375U | Middle East | World Music: Asia |$\quad 4$| Mus 377U |
| :--- | | World Music: Latin America and |
| :--- |
| the Caribbean |

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 distribution 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 |
|  | RehearsalTechniques I |  |
| MuEd 423 | InstrumentalLiterature and | 3 |
|  | RehearsalTechniques II |  |
|  | InstrumentalTrackMusic | 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 | Choral Literature and Rehearsal <br>  <br> MuEd 421 | Techniques I <br> ChoralLiterature and Rehearsal |
|  | Techniques II |  |
|  | Choral TrackMusic Electives | 12 |

Total Teaching Sub-Specialty Credits: 27
Subtotal: 123
PERFORMANCE B.M.
Serving students who seek a professional degree in music with an emphasis in performance, the B.M. in Performance provides a thoroughmusic foundation with specialized coursework in classical instrumental performance, keyboard skills, music theory, and pedagogy. Students pursue immers ive performance experiences in large ensembles and chamber ensembles and solo performance in their recitals. Students successfully completing theB.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 ofMusic 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 |  |
|  | (30 minutes minimum) | 0 |
| Mus 049 | Senior Recital |  |
|  | (60 minutes minimum) | 0 |
| Mus 111 | Music Theory I |  |
| Mus 112 | Music Theory II |  |
| Mus 113 | Music Theory III | 3 |
| Mus 114 | Sight Singing/Ear Training I | 3 |
| Mus 115 | Sight Singing/Ear Training II | 3 |
| Mus 116 | SightSinging/Ear Training III | 1 |
| Mus 188 | Performance Attendance | 1 |
| Mus 194\& | (9 terms required) | 0 |
| Chamber Music |  |  |
| 394 |  | 6 |6

$\begin{array}{lll}\text { Mus 111 } & \text { Music Theory I } & 3 \\ \text { Mus 112 } & \text { Music Theory II } & 3\end{array}$
Mus 113 Music Theory III 3
Mus 114 Sight Singing/Ear Training I
Mus 115 SightSinging/Ear Training II
Mus 116 Sight Singing/Ear Training III

|  | (minimum 3 upper division credits) |  |
| :---: | :---: | :---: |
| Mus 195, | Large Ensemble: Band, | 6 |
| 196, or 197 | Orchestra, orChorus |  |
| 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 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, Renaissance, and Baroque | 4 |
| Mus 305 | 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, $\text { 396. or } 397$ | Large Ensemble: Band, Orchestra orChorus | 6 |
| Mus 411 | Topics in Music History | 2 |
| Mus 481 | Pedagogy | 3 |
| One of the following (4 credits): |  |  |
| Mus 374U | World Music: A frica 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 must be completed at the upper-division level. |  |  |

Mus 206 Listening II3
Mus 212 Music Thoory
3
Mus 214 Sight Singing/Ear Training IV ..... 1Mus 21612
Mus 203 Advanced Class Pinoril4
Mus 311 Oormanalysis3
Mus2

## One of the following (4 credits):

Mus 374U World Music: Africa and the 4
Middle East
Mus 375U World Music: Asia

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 emphasis in vocal performance, the B.M. in Performance with an Emphas is in Voice provides a thorough music foundation with specialized coursework in classical 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 Emphas is in Voice) must complete the following courses:

## Courses

Mup $190 \quad$ Applied Music 6
Mup 290 Applied Music
Mup $390 \quad$ Applied Music 6
Mup $490 \quad$ Applied Music 6
Mus 046 Piano Proficiency Exam 0
Mus 048
Junior Recital (30 minutes minimum)
Mus 049 Senior Recital (60 minutes minimum)
Mus 111
Mus 112
Music Theory I
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 (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 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, Renais sance, and Baroque |  |
| Mus 305 | Music History: Classical and Romantic |  |
| Mus 306 | Music History: 20th Century | 4 |
| Mus 320 | Fundamentals ofConducting | 2 |
| Mus 397 | Chorus | 6 |
| Mus 411 | Topics in Music History | 2 |
| Mus 427 | Opera Workshop |  |
| Mus 428 | Opera Production | 2 |
| Mus 481 | Pedagogy |  |
| Mus 485 | Diction for Singers: Italian | 2 |
| Mus 486 | Diction for Singers: 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: A frica and the Middle East |  |
| Mus 375U | World Music: Asia |  |
| Mus 377U | World Music: Latin America and the Caribbean | 4 |
| Two of the following (8 credits) |  |  |
| It 103 | First-Year Italian Term 3 |  |
| Fr 103 | First-Year French Term 3 | 4 |
| Ger 103 | First-Year German Term 3 | 4 |
|  | Music electives to be chosen by student in consultation with | 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 therelated Large Ensemble each term. Students mustearn 6 credits at each levelof Applied Music. With departmental 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.
Mus 427: Opera Workshop is a one-credit ensemble. Voice majors are required to take Opera Workshop twice.

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 <br> OR |  |
| Mus 111, <br> 112, 113 | Music Theory I, II, \& III | 9 |
| Mus 114, | and |  |
| Sight-Singing/Ear Training I, II | 3 |  |
| Mus 188 116 | \& III | Performance Attendance |

One of the following:
Mus 203, Music of the Western W orld,
274, 301, or Introduction to World Music, or 302

Survey of Music Literature
Upper-divis ion Music History,
World Music, PopularMusic, or
Jazz History Course
Music Electives
4
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 advisor-approved credits ( 17 credits mustbe in residence at Portland State University), to include the following:

## Courses

| Mus 101 | Contemporary Music Theory I | 4 |
| :--- | :--- | ---: |
| Mus 102 | Contemporary Music Theory II | 4 |
| Mus 188 | Performance Attendance <br> (3 terms required) | 0 |
| Mus 203, | Music in the Western World or | 4 |
| 301, or 302 | Survey of Music Literature I or II |  |
| Mus 304, Music History <br> 305, or 306  | 4 |  |

## Any combination of the following for 14 credits:

Mus 191 Group Lessons for Beginners I:
Piano, Guitar or Voice
Mus 192 Group Lessons for Beginners II: 2
Piano, Guitar or Voice
Mus 193 Group Lessons for Beginners III
Piano, Guitar or Voice
Mus 194 or Chamber Music or Chorus 1
197
Mus 304 Music History: Medieval,
Renaiss ance, and Baroque
(if not taken as required)
Mus 305 Music History: Classical and 4
Romantic
(if not taken as required)
Mus $306 \quad 4$
(if not taken as required)
Mus 355U Jazz History
Mus 356U Jazz And American Culture: 4
How History Shaped Our Music, Then and Now
Mus 360U The Guitar: its History and 4
Music
Mus 361U History ofRock Music I (19501970)

Mus 362U History ofRock Music II (1970Present)
Mus 374U World Music: A frica and the 4
Middle East
Mus 375U World Music: Asia 4
Mus 376U American Musical Traditions 4
Mus 377U World Music:Latin America and 4 the Caribbean
Mus 411 Topics in Music History

Subtotal: 30

## THEATER ARTS MINOR

ProgramCoordinator: K. Magaldi
To earn a minor in theater arts a student must complete 28 adviser-approved credits to include the following:

## REQUIREMENTS

## Courses

| TA 151 |  <br> Practice <br> or | 4 |
| :--- | :--- | :--- |
| TA 305U | Understanding Theater | 4 |

TA 201 Script Analysis 4

## Four credits chosen from:

TA 369U Women, Theater, and Society 4
TA 471 TheaterHistory:Periods and 1-4 Topics
TA 472 TheaterHistory:Major Figures
Theater Arts Electives
Theater Arts electives (at least 8
upper-division)
Courses taken under the undifferentiated grading option (pass/no pass) will not be accepted toward fulfilling departmentminor requirements. All courses used to satisfy the minor requirements must be graded C or above.
At least 16 credits must be taken in residenceat Portland State University.
Subtotal: 28

## DANCE CERTIFICATE

Admission to the Dance Certificatehas been suspended effective Fall 2017, and no applications are being accepted at this time.

## Graduate programs

Graduate Coordinator: S. Carlson
The School of Music \& Theater offers graduate work in music leading to the degrees of Master ofMusic (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 ofScience 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 specialists 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 ofstudy 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 MUP 490 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 general requirements for admission 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 placement examination must be passed or the recommended review course mustbe 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, mus ic history, 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, mus icology, ethnomusicology, or music 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 |
| :--- | :--- |
|  | Exam |

Mus 057 Graduate Music Theory Entrance 0
Mup 590 Applied Music 2
Mup $591 \quad$ Applied Music in Secondary 2 Area
Mus 506 Graduate Project or Recital 2
Mus 511 Music Research Methods 3
Mus 520 Analytical Techniques 3
Ensemble: Chosen with advice of 3 graduate faculty

> Education/Pedagogy (chosen with adviser's assistance)

Mup 591: (may substitute Mup 590 credits with adviser approval)

## One of the following: ( $\mathbf{2 - 3} \mathbf{~ c r e d i t s ) ~}$

Mus 522 Advanced Orchestral A rranging 3
Mus 523 Advanced Choral Arranging 3
Mus 524 Instrumental Jazz ArrangingI 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 ChoralLiterature 3
Mus 536 Opera Literature 3
Mus 537 Keyboard Literature 3
Mus 538 Keyboard Literature 3
Mus 539 InstrumentalLiterature 3
Mus 540 Jazz Literature 3
$\begin{array}{ll}\text { Three of the following: ( } \mathbf{6} \text { credits) } \\ \text { Mus } 560 & \text { Music History:The Medieval }\end{array}$
Period
Mus 561 Music History: The Renaissance
Period
Mus 562 Music History:The Baroque Period
Mus 563 Music History:The Classical Period
Mus 564 Music History:The Romantic Period
Mus 565 Music History: Early 20th
Century
Mus 566 Music History: Music Since

## One of the following (determined in conjunction with advisor) ( $\mathbf{3}$ credits)

Mus 541 Advanced Conducting Methods 3
Mus 542 Advanced Choral Conducting 3
Mus 543 Advanced Instrumental 3
Conducting
Elective Studies Selected with an $\quad 9-10$
Advisor
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 ofB 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 constitutea Pass for the Music Theory Entrance Exam.

All M.A./M.S. candidates must take a final written examination. All graduates tudents must receive a grade of $B$ or above in music courses.

## THEATER ARTS M.A./M.S. PROGRAM

## Advisor: R. Wattenberg

Admission to the MA/MS in Theater Arts has been suspended effective fall 2015, and no applications are being accepted at this time.

## MASTER OF MUSIC M.M. PROGRAM

## M ASTER OF M USIC 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 them for continued study in a doctoral programorto pursueprofessional 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 |
|  | Exam |  |
| Mup 590 | Applied Music | 12 |
| Mus 506 | Graduate Project or Recital | 2 |
| Mus 511 | Music ResearchMethods | 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 | 2 |
|  | Period |  |
| Mus 562 | Music History: The Baroque | 2 |
|  | Period |  |
| Mus 563 | Music History: The Classical | 2 |
|  | Period |  |
| Mus 564 | Music History: The Romantic | 2 |
|  | Period |  |


| 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 | Chamber Music Literature |
| Mus 532 | Band Wind Literature |
| Mus 533 | OrchestralLiterature |
| Mus 534 | ChoralLiterature |
| Mus 536 | Opera Literature |
| Mus 537 | Keyboard Literature |
| Mus 538 | Keyboard Literature |
| Mus 539 | Instrumental Literature |
| Mus 540 | Jazz Literature |
| One of the following (3 credits) |  |
| Mus 581 | Pedagogy |
| Chosen with advice of graduate faculty: ( $\mathbf{3}$ credits) |  |
| Mus 527 | Opera Workshop |
| Mus 594 | Chamber Music |
| Mus 595 | Band |
| Mus 596 | Orchestra |
| Mus 597 | Chorus |
| Mus 598 | Jazz Lab Band |
|  | Elective Studies Selected with an Advisor |

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 ofB 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 final oral examination. All graduatestudents 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 them for
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 ResearchMethods | 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 for Singers: Italian | 2 |
| Mus 586 | Diction for Singers: 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 Classical | 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: ( $\mathbf{3}$ 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 mus ic history course with the exception of Mus 529, Grad History Review. A grade ofB 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 final oral examination. All graduatestudents must receive a grade of $B$ or above in music courses.

Subtotal: 45

## M ASTER OF M USIC IN CONDUCTING

Serving students who seek a professional graduate degree in conducting, the M.M. in Conducting provides advanced studies in conducting, literature, arranging, music his tory, music theory, score reading, and research methods. Students specialize in choral or instrumental 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 them for continuedstudy 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 | Graduate Music History | 0 |
|  | Entrance Exam |  |
| Mus 057 | Graduate Music Theory Entrance Exam | 0 |
| Mus 506 | Graduate Project or Recital | 2 |
| Mus 511 | Music Research Methods | 3 |
| Mus 513 | Score Reading | 3 |
| Mus 520 | Analytical Techniques | 3 |
| One of the following: ( 3 credits) |  |  |
| Mus 522 | Advanced Orchestral Arranging | 3 |
| Mus 523 | Advanced Choral Arranging | 3 |
| One of the following: ( 3 credits) |  |  |
| Mus 532 | Band Wind Literature | 3 |
| Mus 533 | OrchestralLiterature | 3 |
| Mus 534 | ChoralLiterature | 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 | Music History:The Medieval <br> Period | 2 |
| Mus 561 | Music History:The Renaissance <br> Period | 2 |
| Mus 562 | Music History:The Baroque <br> Period | 2 |
| Mus 563 | Music History:The Clas sical | 2 |
| Mus 564 | Period <br> Music History:The Romantic | 2 |
| Mus 565 | Period <br> Music History:Early 20th <br> Century | 2 |
| Mus 566 | Music History:Music Since <br> 1950 | 2 |

Chosen with advice of graduate faculty ( $\mathbf{6}$ credits)

| Mus 595 | Band | 1 |
| :--- | :--- | :--- |
| Mus 596 | Orchestra | 1 |
| Mus 597 | Chorus | 1 |
|  |  |  |
|  | Elective Studies Selected with an | 9 |
|  | Advisor |  |

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 ofB 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 graduates tudents must receive a grade of B or above in music courses.
Subtotal:45

## M ASTER OF M USIC 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, improvisation, 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 necessary skills to prepare them for 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 |
| :--- | :--- | ---: |
| Mus 057 | Entrance Exam |  |
|  | Graduate Music Theory Entrance | 0 |
| Mup 590 | Exam |  |
| Applied Music | 12 |  |

Mus 506 Graduate Project or Recital 2
Mus 511 Music Research Methods 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 <br> Meriod | 2 |
| :--- | :--- | :--- |
| Mus 561 | Music History: The Renaissance <br> Period | 2 |


| Mus 562 | Music History: The Baroque <br> Period <br> Mus 563 |
| :--- | :--- |
| Music History: The Classical |  |
| Mus 564 | Period <br> Music History: The Romantic |
| Mus 565 | Period <br> Music History: Early 20th <br> Century |
| Mus 566 | Music History: Music Since <br> 1950 |
| Complete 3 credits from the following: (3 credits) |  |
| Mus 594 | Chamber Music <br> Mus 598 <br>  <br> Jazz Lab Band |
|  | Elective Studies Selected with |
| Advisor |  |

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 ofB 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 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 thems elves 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 ens emble credits, chosen with advice of graduate faculty:
Mus 527
Opera Workshop

| Mus 528 | Opera Production | 2 |
| :--- | :--- | :--- |
| Mus 594 | Chamber Music | 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 ofMusic | 3 |
| Mus 580 | Body Mapping forMusicians: | 2 |
|  | Anatomy, Physiology, |  |
|  | Movementand Sensory |  |
| Mus 581 | Awareness |  |
|  | Pedagogy | 3 |

Recommended for Instrumentalists
Mus 531 Chamber Music Literature 3
Mus 533 OrchestralLiterature 3
Mus 537 KeyboardLiterature 3
Mus 538 Keyboard Literature 3
Mus 539 InstrumentalLiterature 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 3
Mus 536 Opera Literature 3
Mus 585 Diction for Singers:Italian 2
Mus 586 Diction for Singers:German 2
Mus 587 Diction for Singers: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 Improvisation II | 2 |
| Mus 573 | Advanced Jazz Improvisation III | 2 |

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 candidate takes 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, Associate Dean, Faculty \& Research
Erica Wagner, Associate Dean, Undergraduate Programs
Melissa 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 Real Estate Property Management, Business Minor in Advertising (for graphic design majors), Advertising Minor (for communications majors), Property ManagementMinor.
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-baccalaureateCertificate in Consumer Retail.

## Graduate Programs

M.B.A.-Master of Business Administration, M.S.Master of Science in Applied DataScience for Business, 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 - As sociation to Advance Collegiate Schools of Business. The School's accounting programhas separate accreditation from the AACSB. Such accreditation means that The School ofBusiness 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 its elf 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 miss ion of the undergraduate program is to provide students with a broad understanding of business and to equip themwith the dynamic skills required to work successfully in a complex and changing global environment.
Special emphas is options are available within the business administration 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 available. The School of Bus iness offers study abroad opportunities at the undergraduate and graduate levels.
The School of Bus iness offers online business concentrations in Bus iness Technology \& Analytics, Management \& Leadership, Human Resource Management or Supply \& Logistics Management and a hybrid degreeoption for Accounting.

## Student Advising

Undergraduate academic and career advisors are located in the Karl Miller Center Suite 220. Students should plan to meet with their advis or 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
organizations, internships, and career opportunities, policies, and other information vital to all bus iness students.

## Atmos Program

As the largest and most diverse business school in Oregon, we believe diversity, cultural a wareness, and the inclusion of all people is paramount for institutional impact an global change. We believe inclusion and excellence are not mutually exclusive. This belief motivates everything we do. The Atmos program supports diverse and underrepresented minority business students of color and is a promise of academic and community support to help create an avenue for 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.pdxedu/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 Univers ity. However, students must formally join The School of Business before they are allowed to enroll in almost all 200-, 300- or 400-level business adminis tration courses or to graduate with a bus iness administration 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
Introductionto Business and World Affairs
BA 205 Business Communications Using Technology
BA 211 Fundamentals ofFinancial Accounting
BA 213 Decision Making with
Accounting Information
Ec 201 Principles of Microeconomics
Ec 202 Principles of Macroeconomics 4
Stat 241 Application of Statistics for
Business
or
Stat 243 Introduction to Probability and Statistics I
Comm 220
Wr 121

## Freshman Inquiry

BA 101: (waived for post-baccalaureate students)
BA 205: (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 Acade mic Standing Policy

A minimum Portland State University cumulative GPA of 2.50 and a minimum GPA of 2.50 in business administration courses taken at Portland State University are required to remain in good standing as a business administrationstudent and for graduation with a degree in businessadminis tration. 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 dismissed by the University, that student will automatically loseSchool ofBusiness admitted status. If a student who has lost admitted status desires to complete degree requirements for programs in the School of Business, thatstudent must reapply. Atthe time of reapplication the student mustmeet the required 2.50 PSU and PSU Schoolof Business GPA requirement.

## BUSINESS ADMINISTRATION B.A./B.S.

## Require ments 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 iftaken 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. Each student in businessmust also take at least 90 credits outside the School of Business. A minimum of 180 credits is required for graduation.

## Prerequisite policy

Prerequisites are strictly enforced in the School of Business and exceptions are not made. Before enrolling in any bus iness course, students should read the course description and mustcomplete 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 ifthey have met the Bachelor of Arts or Bachelor of Science requirements. This can be done by emailing their business advis or 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:

## Business specialization options

(see descriptions below)
Subtotal: 20-36

| Core courses |  |  |
| :---: | :---: | :---: |
| BA 101 | Introduction to Business and World Affairs | 4 |
| BA 205 | Business Communications Using Technology | 4 |
| BA 211 | Fundamentals ofFinancial Accounting | 4 |
| BA 213 | Decision Making with Accounting Information |  |
| BA 301 | Research and Analysis of Business Problems |  |
| BA 302 | Organizational Behavior | 0-4 |
| BA 303 | Business Finance | 4 |
| BA 311 | Marketing Management |  |
| BA 325 | Information Literacy \& Technical Competence for Business Professionals | 4 |
| BA 327 | Data Analysis \& Visualization | 2 |
| BA 339 | Supply Chain Management | 0-4 |
| BA 385 | Business Environment | 4 |
| BA 495 | Business Strategy | 6 |

Subtotal: 52

## BUSINESS CONCENTRATIONS

The School of Bus iness offers concentrations for those students seeking specialization in a subject area. Each studentmust select one of these concentrations and complete the required courses with a C - or better. Concentration requirements are satisfied by taking 20 to 36 upper-division credits beyond 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, or governmental accounting.

| Actg 335 | Accounting Information Systems <br> and Analytic Fundamentals | 4 |
| :--- | :--- | :--- |
| Actg 360 | Management Accounting | 4 |
| Actg 381 | Financial Accounting and <br> Reporting I | 4 |
| Actg 382 | Financial Accounting and | 4 |
| Actg 383 | Reporting II |  |
|  | Financial Accounting and | 4 |
| Actg 421 | Reporting III | 4 |
| Actg 430 | Taxation | 4 |
| Actg 492 | Auditing Concepts andPractices | 4 |
| Actg 495 | Integrated Accounting Issues | 4 |

One upper-division 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 490 | Advanced Financial Accounting | 2 |
| Actg 493 | Advanced Auditing | 4 |
| Actg 407 | Seminar | 1-6 |
| Subtotal: 36-38 |  |  |
| Business Technology and Analytics |  |  |
| Objective: to provide requisite knowledge and skills which enable the student to meet the challenges of working within information-rich business environments. |  |  |
|  | Subtotal: 28 |  |
| Core |  |  |
| BTA 350 | Business ProblemSolving with | 4 |
|  | Analytics and Visualization |  |
| BTA 415 | Database Management | 4 |
| BTA 419 | Business Analytics with | 4 |
|  | Programming |  |
| BTA 420 | Systems Analysis and Design | 4 |
| BTA 428 | Data Privacy, Security and Ethics | 4 |

Subtotal: 20

## Electives

The 8 credits of electives can be either: within the Business Technology and Analytics area at the 400 level or from an approved list of courses.

## Approvedelectives:

Actg 407 Accounting Analytics 4
Actg 335 Accounting Information Systems 4 and Analytic Fundamentals

| GSCM 412 | Introductionto Enterprise | 4 |
| :---: | :---: | :---: |
|  | Resource Planning Systems |  |
| GSCM 450 | Project Management | 4 |
| Mgmt 442 | Human Resources Information | 4 |
|  | Systems \& People Analytics |  |
| Mktg 460 | Marketing Research | 4 |
| ISQA 481 | Blockchain Fundamentals | 4 |
|  | And |  |
| BTA 482 | Blockchain Fundamentals Lab | 2 |

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 advertis ing strategy within the broader context ofthe marketing function. |  |  |
|  |  |  |
| Mktg 340U | Advertising | 4 |
| Mktg 363 | ConsumerBehavior and | 4 |
|  | Customer Satisfaction |  |
| Mktg 441 | Media Strategy | 4 |
| Mktg 442 | Creative Strategy | 4 |
| Mktg 443 | Advertising Campaigns | 4 |
| Mktg 460 | Marketing Research | 4 |

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 financial decision 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 | 4 |
| :--- | :--- | :---: |
| Fin 319 | Reporting I <br> Intermediate Financial | 4 |
|  | Management |  |
| Fin 352 | Investments | 4 |
| Fin 449 | Valuation | 4 |
|  |  | Subtotal: 16 |

One upper-division finance course to be chos en 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 |

## Two upper-division finance courses to be chosen from:

| Fin 410 | Selected Topics | $1-4$ |
| :--- | :--- | ---: |
| Fin 419 | FinancialData Analytics \& | 4 |
| Fin 441 | Modeling |  |
|  | Fundamentals ofDerivative | 4 |
| Fin 465 | Securities |  |
| Fin 473 | Finance Topics and Cases <br> Investment Analysis and <br> Portfolio Management | 4 |

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 | 4 |
| Mgmt 471 | Performance Management |  |
| Mgmt 493 | Suman and Employee Selection | 4 |
|  | Upper-division management <br> courses | 4 |
|  | Elective | 4 |
|  |  | 4 |

Subtotal: 24
Of the 8 credits of electives, four credits must be taken within the management area at the 400 level.

The final four elective credits mustbe froman approved list of courses.

Note: Students who wish to complete a double concentration in management \& leadership and human resource management cannot 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 | OrganizationalDesignand | 4 |
|  | Change |  |
| Mgmt 464 | Contemporary Leadership Issues | 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 fourcredits 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 resource 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 careersuccess.

| Mktg 363 | ConsumerBehavior and <br> Customer Satisfaction | 4 |
| :--- | :--- | ---: |
| Mktg 460 | Marketing Research | 4 |
| Mktg 464 | Marketing Strategy and | 4 |
| Mktg 462 | Management | 4 |
| Marketing Analytics | 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-divis ion (300- or 400-level) elective courses offered at the School ofBusiness 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, logistics, transportation, and operations management.
GSCM 429 Global transportation and Logistics management
GSCM 439 Global Sourcing and Negotiation
4
GSCM 479 Global Supply Chain Strategy 4
and Sustainability Management
Three of the following electives as approved by supply and logistics management faculty:
GSCM 410 Selected Studies 1-8
GSCM 412 Introduction to Enterprise
Resource Planning Systems
GSCM 432 Craft Beverage Operations Management
GSCM 440 Governmental Procurement
GSCM 450 Project Management
GSCM 451 Business Forecasting
GSCM 454 Supply and Logistics Negotiations

| GSCM 458 | Purchasing and Logistics within <br> 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 | 4 |
|  | Freight |  |
| ISQA 431 | Transportation Regulation | 4 |
|  | Otherelectives as approved by |  |
|  | Supply and Logistics faculty |  |

Subtotal: 24

## School of Business Honors Track

The School of Business Honors Programis a cohort of high performing, dedicated undergraduate business students who want to take core business courses and build lasting relationships with other honors students, build leadership skills, attend monthly professional development workshops thatoffer 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 ofspecial honors sections of core business courses and enjoy special opportunities to interact with business professionals, 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 leadershipcourse
- Monthly professional development workshops (during the academic year), including events featuring guest speakers, business executives, and bus iness 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 until all application materials are submitted at the end of their sophomoreyear.
Honors programrequirements are subject to change. For the most current honors requirements, more detailed application information, and link to apply visit: www.pdx.edu/sba/business-honors-track

## BUSINESS ADMINISTRATION MINOR

The School of Business offers a 28 credit minor to students majoring in otherdisciplines who wish to add a business background to their programofstudy. 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 small firm or practice.

## REQUIREMENTS

Coursework requirements for the minor in business administration are as follows.

## Courses

| BA 101 | Introductionto Business and <br> World Affairs |
| :--- | :--- |
| Fin 218 | PersonalFinance <br> BA 306U |
| Essentials of Finance for Non- |  |
| Business Majors |  |
| BA 32U | Essentials of Marketing for Non- <br> Business Majors |
| BA 336U | Essentials of Management for <br> Non-Business Majors |
| Bssentials of Information |  |
| BA 346U | Technology for Non-Business <br> Majors <br> Essentials of Entrepreneurship <br> 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.

## COURSE OF STUDY

| BA 101 | Introductionto Business and |
| :--- | :--- |
|  | World Affairs |
| BA 306U | Essentials ofFinance for Non- <br>  <br>  <br> Business Majors |


| BA 316U | Essentials ofMarketing forNon- <br> Business Majors | 4 |
| :--- | :--- | ---: |
| BA 326U | Essentials ofManagement for <br> Non-Business Majors | 4 |
| Mgmt 421 | Nesign Thinking for Social <br> Dgmt 422 | Innovation <br> Money Matters for Social <br> Innovation |
| Mgmt 423 | Storytelling and Impact <br> Measurement for Social | 4 |
|  | Innovation | 4 |

Subtotal: 28

## BUSINESS MINOR IN REAL ESTATE PROPERTY MANAGEMENT

The Business Minor in Real Estate Property Management is designed for non-business majors interested in real estate 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 oftechnicalskills (marketing/leasing, finance, building maintenance) and people management skills (critical thinking and problemsolving, human resourcemanagement, and customer service). Completion of the minor prepares students for careers as a real estate property manager, as set manager, as well as realestate lending, brokerage, and appraisal.

## REQUIREMENTS

| BA 101 | Introduction to Business and | 4 |
| :--- | :--- | :---: |
| BA 306U | World Affairs <br> Essentials ofFinance for Non- <br> Business Majors | 4 |
| BA 316U | Essentials ofMarketing forNon- <br> Business Majors <br> Es 326U | 4 |
| BA 332U | EsNon-Bus iness Majors <br> Property, Management \& for | 4 |
| Mgmt 432 | Society <br> Multifamily Property | 4 |
| Mgmt 433 | Management <br> Commercial Property and Asset <br> Management | 4 |

## Total Credit Hours: 28

## BUSINESS MINOR IN ADVERTISING FOR GRAPHIC DESIGN MAJORS

The Bus iness Minor in Advertising for graphic design majors provides critical business, marketing and advertis ing skills to students who plan careers in the graphic design field. The seven courses in the minor provide an applied approach to the basic functional areas
of business planning, finance, organizational management, marketing and advertising, including marketing's role in bus iness, 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 Advertising Management Minor courses is a C-.

## REQUIREMENTS

Interested students should contact their adv is or in the School of Business Undergraduate Programs Office to plan out the required courses. Courses in the minor include:

## Courses

| BA 101 | Introductionto Business and | 4 |
| :--- | :--- | :--- |
|  | World Affairs |  |
| BA 316U | Essentials of Marketing forNon- | 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 StudentAd | 4 |
|  | Agency |  |
| Mktg 443 | Advertising Campaigns | 4 |
| Mktg 449 | Portfolio Workshop | 2 |

Total Credit Hours: 24

## ADVERTISING MINOR FOR COMMUNICATIONS MAJORS

## REQUIREMENTS

The Advertis ing Management minor for communication majors requires 24 credit hours. Theobjectiveofthis minor is to familiarize communication majors with general bus iness practices and the marketing communications industry specifically. The undergraduate minor's focus is interd is ciplinary, including courses in the School of Business and the communication department. Twenty of these hours will be taken with in the School of Bus iness and fourcredit hours can be a communication or business elective. All courses must be graded, the minimum passing grade for the Advertising Management Minor courses is a C-

## Five required courses:

| BA 316U | Essentials of Marketing for Non- | 4 |
| :--- | :--- | :--- |
|  | Business Majors |  |
| 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 otherMKTGcourses and should be taken early.

Mktg 441 \& Mktg 442 are prerequisites for Mktg 443.
Plus one communication or business elective from the following:

| Mktg 440 | Practicum: FIR NW Student Ad | 4 |
| :--- | :--- | :--- |
|  | Agency <br> Mktg 448 | Digital Media Planning and |
|  | Analytics | 4 |
| Mktg 449 | Portfolio Workshop | 2 |
| Comm 341 | Introduction to 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 undergraduate degree is not in business adminis tration.

## 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 ofFinancial 4
Accounting
BA 213 Decision Making with
Accounting Information
Stat 241 Application of Statistics for 4
Business
Ec 201 Principles of Microeconomics 4
Ec 202 Principles of Macroeconomics 4
Subtotal: 20
Note:BA 101 prerequisiteforBA 211 is waived for postbaccalaureate students; contact your advisorvia email for a regis tration override to get into BA 211. Contact information for all School of Business Career \& Academic

Advis ors is available online at www.pdx.edu/sba/career-academic-advising .

## REQUIREMENTS

Core
Actg 335
Actg $360 \quad$ ManagementAccounting 4
Actg $381 \quad$ Financial Accounting and 4 Reporting I
Actg 382
Actg 383 Reporting II

Actg 421
Actg 430
Actg 492
Actg 495
Accounting Information Systems

Reporting III
Taxation

## Additional credits chosen from: (7-8 credits)

Actg $422 \quad$ Advanced Taxation 4

Actg $445 \quad$ Forensic Accounting 4
Actg $460 \quad$ Advanced Managerial 4
Accounting
Actg 485 Business Law 4
Actg 490 Advanced FinancialAccounting 2
Actg 493 Advanced Auditing 4
Actg 407 Seminar

## Other required credits

$$
\begin{array}{ll}
\text { BA 303 } & \text { Business Finance } \\
\text { BA 325 } & \text { Information Literacy \& } \\
& \text { Technical Competence for } \\
& \text { Business Professionals }
\end{array}
$$

## 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 for students who want to go beyond product design and sports management to examine the larger competitive industry issues 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 Bus iness students must complete degree requirements specified for a Bus iness Administration major to be awarded the Athletic \& Outdoor Industry Certificate. Non-business majors must complete BA 316U, MKTG 436, MKTG437, MKTG 375, 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 differentrequirements for different majors.

| Required Courses (16 credits): |  |  |
| :---: | :---: | :---: |
| BA 311 | Marketing Management | 4 |
| BA 316U | Essentials of Marketing forNonBusiness Majors | 4 |
| Mktg 375 | Retailing | 4 |
| Mktg 436 | Competitive Dynamics in the | 4 |
| Mktg 437 | Athletic and Outdoor Industry Product Management in the Athletic and Outdoor Industry | 4 |
| Select two cours es from the college/major as listed below (8 credits): |  |  |
| School of Business |  |  |
| Other courses may be substituted with the permis sion of the program director. |  |  |
| Mktg 338U | Professional Selling or | 4 |
| Mktg 467 | Sales Management | 4 |
| GSCM 429 | Global transportation and Logistics management or | 4 |
| 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 Psychology | 4 |
| Textile Arts |  |  |
| Art 313 | Textile Design | 4 |
|  |  |  |
| Art 316 | Fabric \& Form | 4 |
| Art 416 | Textile Arts Studio | 4 |
| Subtotal: 24 |  |  |
| Total Credit Hours: 24 |  |  |
| BUSINESS BLOCKCHAIN UNDERGRADUATE CERTIFICATE |  |  |

The objectiveofthe Business Blockchain Certificate is to provide students with knowledge of blockchain and cryptocurrency concepts and an understanding of how these technologies can transformbus inesses and industries. The programwill equip students with the ability to 1 ) use analytical skills to address technical and business problems, 2) work with distributed ledger technologies, and 3) res pond 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 bus inessundergraduate concentration can strengthen their businessknowledge and skill by adding thecertificate to their degree programs.

| ISQA 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 <br>  <br> Applications | 4 |
| 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.

| Electives |  |  |
| :---: | :---: | :---: |
| Select two courses from the following menu: |  |  |
| Mktg 338U | Professional 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 Business | 4 |
| Subtotal: 8 |  |  |
| Core |  |  |
| BA 316U | Essentials of Marketing forNonBusiness Majors | 4 |
| Mktg 363 | Consumer Behavior and Customer Satis faction or | 4 |
| Mktg 435 | Consumer PackageGoods Marketing | 4 |
| GSCM 310 | Introduction to Supply Chain ManagementofFood and Beverage Systems | 4 |

Subtotal: 12

## Total Credit Hours: 20

Minimum grade requirement: C-
P/NP allowed: Yes

## ENTREPRENEURSHIP CERTIFICATE

Learn the fundamentals ofentrepreneurship by identifying market needs, conceptualizing approaches to fulfill those needs, researching potential avenues, assessing enduring bus iness models, structuring the venture, rais ing funding for launch and sustained growth.

Students are required to complete the degree requirements specified for a business administration 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 onechosen 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 consumer packaged goods distribution, marketing, and management. Certificate requirements includethe 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 merchandising. Certificate courses include strong industry participation from guest speakers to current case studies.

Business majors must complete degree requirements specified for a business option to be awarded the Food, Beverage \& Goods Leadership Certificate.

This certificate can also be added to majors with approved pathways. School ofBusiness students must complete degree requirements specified for a Business Administration major to be awarded the Food, Bev \& Goods Leadership Certificate. Non-business majors must complete BA 316U, MKTG 375, MKTG 435, GSCM 310, 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.

## Select two cours es from the college/major as listed below (8 credits): <br> School of Business

Other courses may be substituted with the permis sion of the programdirector.

| Actg 460 | Advanced Managerial Accounting | 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 467 | Sales Management | 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
Des 408 Workshop

| Psychology Major |  |  |
| :---: | :---: | :---: |
| Psy 361 | IndustrialPsychology | 4 |
| Psy 362 | Organizational Psychology | 4 |
| Required Courses (16 credits) |  |  |
| BA 311 | Marketing Management or | 4 |
| BA 316U | Essentials of Marketing forNonBusiness Majors | 4 |
| GSCM 310 | Introduction to Supply Chain ManagementofFood and Beverage Systems | 4 |
| Mktg 375 | Retailing | 4 |
| Mktg 435 | Consumer PackageGoods Marketing | 4 |

## Total Credit Hours: 24

## INTERNATIONAL BUSINESS CERTIFICATE

The International Business Certificate provides undergraduate students with an educational foundation in the field of internationalbusiness. 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 administration option in order to be awarded the International Business Certificate. In addition, students must completeall 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 = 24 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 advisor.


## Language, Area Studies, or International Economics (12 credits)

Select any 12 credits of language, economics, or global perspectives cluster courses

- Language - Any foreign language offered at PSU
- Area Studies - Selected fromthe global perspectives cluster list or other courses with advis or approval. The area study courses will be upper divis ion and must contribute to the student's understanding of the area of the foreign 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 sponsored for credit by a faculty member of the School of Business.


## Campus Option $=\mathbf{3 6}$ credits

## Language ( 12 credits)

- Any foreign language offered at PSU- 12 credits of the same language - any level.


## Area Studies or International Economics (12 credits)

- Area Studies - Selected fromthe global perspectives cluster list or other courses with advis or approval. The area study courses will be upper division and must contribute to the student's understanding of the area of the foreign 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.


## International Business ( 12 credits)

Selected from:

- Fin 456 International Financial Management
- Mktg 376 International Bus iness
- Mktg 446 International Management
- Mktg 466 Principles of International Marketing
- or other courses approved by advis or.

REAL ESTATE PROPERTY MANAGEMENT
CERTIFICATE

The Certificate in Real Estate Property Management is open to undergraduate business schoolstudents and provides students with foundational, industry-specific knowledge in real estateproperty management. The Certificate introduces students to the fields of both multifamily (apartment) and commercial (office, retail, industrial, etc.) property management and prepares students for entry-level employment in operations and leasing as a property manager, as set manager, and corporatereal estate 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 administration 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 |

Subtotal: 12

## Electives

|  | Subtotal: 7-8 |  |
| :--- | :--- | ---: |
| Choose a minimum of $\mathbf{4}$ elective credits from these <br> courses: <br> USP 312U | Urban Housing and Development | 4 |
| USP 323U | Real Estate Development and | 4 |
|  | Finance |  |
| Actg 404 | Internship | $1-6$ |
| Fin 404 | Internship | $1-6$ |
| GSCM 404 | Cooperative |  |
| Mgmt 404 | Education/Internship | $1-6$ |
| Mktg 404 | Internship | $1-6$ |
| 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 Issues | 4 |
| Mktg 338U | Professional Selling | 4 |
| Mktg 464 | Marketing Strategy and | 4 |
|  | Management |  |

Total Credit Hours: 19-20

## SOCIAL INNOVATION AND SOCIAL ENTREPRENEURSHIP UNDERGRADUATE CERTIFICATE


#### Abstract

The Social Innovation and SocialEntrepreneurship Certificate programis open to undergraduate and graduate students and equips students with the latest tools 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 peermentors, 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 REQUIREMENTS

| Undergraduate Certificate Requirements <br> Mgmt 421 | Design Thinking for Social <br> Innovation | 4 |
| :---: | :--- | :---: |
| ETM 356U | or <br> Introduction to Human-Centered <br> Design | 4 |
| Mgmt 422 | Money Matters for Social <br> Mgmt 423Innovation <br> Storytelling and Impact <br> Measurement for Social <br> Innovation | 4 |
| Mgmt 409 | Social Innovation Practicum <br> or | 4 |
| Mgmt 310 | Entrepreneurship for Sustainable <br> Development | 4 |

Subtotal: 16

## Graduate programs

The School of Bus iness offers seven programs leading to master's degrees. The Schoolalso participates in the SystemScience Doctoral Program.

## 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 everything is completed properly. An admissions coordinator will contact you with a confirmation once your application is received at the Graduate Bus iness Programs Office.

## Fall Admission

Application and alls supporting documents are dueby May 1 for the following graduate business programs:

- The Portland MBA
- The Healthcare MBA
- Joint JD/MBA
- Master of Real Estate Development
- MS in Finance
- MS in Global Supply Chain Management
- MS in Applied Data Science for Business Application and allsupporting documents are dueby September 1 for the following graduate certificates:
- Athletic \& Outdoor Industry
- Business Blockchain
- Business Intelligence and Analytics
- Global Supply Chain Management
- HR Analytics
- Social Innovation
- Taxation
- Real Estate Investment and Finance


## Winter Admission

Application and all supporting documents are dueby 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 dueby 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 graduate business programs and certificates:

- Master ofTaxation
- Athletic \& Outdoor Industry
- Social Innovation
- Taxation
- Real Estate Investmentand Finance


## DEGREE PREREQUISITE REQUIREMENTS

## Master of Finance (MSF)

All applicants need to complete the following introductory coursework priorto admis sion: Financial Accounting, Managerial Accounting and Statistics. Applicants are also expected to be proficient in computer applications and spreadsheet skills.
See website fordetails.

## Master of Taxation (MT)

In addition to meeting the requirements for PSU and the Schoolof Business, programapplicants should meet oneof 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 orhigher 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 program focused on leadership, innovation and sustainability. Students master 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 perspectives. A highlightof 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 bus iness 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 program in either the full-time or part-time evening format. Students are expected to progress through the programwith 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 program is to develop highly effective managers and leaders. Students develop expertise in the technical areas ofbusiness, managerial competencies, and the ability to integrate technical expertise with managerial competencies to become effective leaders in org anizations. 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 thestudent 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 $516 \quad$ the Firm $\quad$ 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 | Financial Reporting | 4 |
| :--- | :--- | :--- |
| Actg 513 | Managerial Accounting and | 4 |
|  | Control |  |
| Mktg 512 | Marketing Strategy | 4 |
| Mgmt 512 | Organizational Management | 4 |

Fin 513 Financial Management 4
ISQA 511 Sustainable Operations
Management

## APPLIED SKILLS \& LEADERSHIP (22 CREDITS)

In the MBA program, student's leadership skills are assessed and developed through integrated leadership courses, continuous attention to managerial competencies, skills and perspectives, and one-on-one leadership coaching. Students apply the technical business skills and leadership competencies gained through the MBA program in an intensive immers ion experience midway through the program, and in a team-based consulting project with a regionalorganization.
Courses

BA 521

BA 522 Communications for Leaders 1
BA 523 Executive Perspectives on 1
Leadership
BA 524 Leadership Immersion 1
BA 525 Capstone Consulting Project 4
BA 526 MBA International Experience 4
BA 527 MBA Domestic Business 4
Experience
BA 528 MBA Culture Module 1
BA $529 \quad$ Building Effective Teams 1
BA 530 ThoughtLeadership 1
Fin $517 \quad$ Corporate Governance 2
Mgmt $516 \quad$ Project Management 2
Mgmt 517 Negotiations for Managers 2

## CERTIFICATES: OPTIONAL

See the MBA website for certificate options.

## WAIVER POLICY

Students may be eligible for waiver of some required courses in the MBA program. A waiver is based upon the studentholding 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 above only, 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 the MBA creates an opportunity to develop a concentrated skill set within the finance area. This option provides students the skills to understand complex financial issues as well as experience in the application of financial tools that facilitate problemsolving. Students mustchoose electives from the approved Finance option elective list.

## IM MERSIVE 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' globalmindsets in order to gain a globalperspective. The IE requires 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 IE or 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 MS GSCM degrees. For details contact the Academic Advising Team.

## APPLIED DATA SCIENCE FOR BUSINESS (M.S.)

The online Master ofScience in Applied Data Science for Business (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 business fundamentals of accounting and strategy; the critical business implications of digital transformation and the organizational change that it will necessitate; 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 4

Mgmt 519 Digital Transformation: Security, Privacy \& Ethics
Mgmt 520 Leading OrganizationalChange 4 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 Accounting GSCM 520 Global Supply Chain Strategy
ISQA 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 ISQA 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 taken from any of the other certificates or elective courses approved by the Academic Director.
If ISQA 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 elective courses approved by the Academic Director.
The following graduatecertificates approved for the Master's programare:

- Human Resources Analytics (p.129)(18 credits)
- Business Intelligence \& Analytics (p. 129) (21 Credits)
- Business Blockchain (p.128) (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 Business 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. Faculty are a blend of OHSU and PSU faculty and healthcare practitioners. The student cohort is comprised of individuals in roles across the healthcare spectrum, including those serving in direct patientcare capacities as well as those in administration; students represent large and small health care systems, clinics, government, biotech industry, pharmaceuticals, research, medical device companies, and many more.
Curriculum offered through OHSU:

| Course | Title | Credits |
| :--- | :--- | :--- |
| MGT | Organizational Mindsets for | 5 |
| 520 | Managers |  |
| MGT | Business Strategy in Healthcare | 4 |
| 530 |  | 5 |
| MGT <br> 532 | Design \& Innovation |  |
| MGT <br> 549 | Business Intelligence | 4 |
| MGT <br> 554 | Capstone | 5 |
| MGT <br> 560 | Healthcare Systems | 5 |
| MGT <br> 561 | Financial Reporting | 4 |
| MGT <br> 562 | Portfolio Management | 4 |
| MGT <br> 565 | Leadership Skills for Healthcare | 4 |
| MGT | Marketing and Strategic <br> 569 | Communication <br> MGT |
| Operations \& Quality <br> 570 | Managementin Healthcare | 5 |


| MGT | Financial Management | 4 |
| :--- | :--- | :---: |
| 572 |  | 4 |
| MGT | Healthcare Economics |  |
| 575 |  |  |
| MGT <br> 576 | Executive Decision Making | 5 |
|  |  | 63 |

## 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 advance a career in finance. The curriculumis designed to develop forward-thinking professionals with sharp analytic minds, effective communication skills, and the necessary vision to apply financial analysis skills in a wide variety ofbusiness 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.

## REQUIREMENTS

Successful completion of the MSF requires 49 credits.

| Fin 516 | Managerial Macroeconomics | 2 |
| :---: | :---: | :---: |
| Fin 531 | Financial Institutions | 2 |
| Fin 535 | Financial Information Systems | 2 |
| Fin 545 | Hedging and Risk Management | 4 |
| Fin 551 | Financial Management for Financial Analysts | 4 |
| Fin 552 | Investments | 4 |
| Fin 555 | Applied Econometrics for | 4 |
|  | Financial Analysis |  |
| Fin 565 | Corporate Financial Strategies | 4 |
| Fin 525 | Finance Caps toneProject | 2 |
| Actg 550 | Advanced Financial Reporting | 4 |
| Actg 553 | Financial Statement Analysis | 4 |
| Actg 560 | Professional Ethics and the Public Interest | 2 |
| BA 522 | Communications forLeaders | 1 |
| BTA 519 | Managerial Analytics | 4 |
| Mgmt 511 | Foundations of Strategy | 2 |
| Electives |  | 4* |

Total: 49
Waiver Policy
Students may be eligible for waiver of required courses in the MSF program. A waiver is basedupon the student holding an undergraduate degree (earned within the previous seven years) in the specific discipline for which the waiver is sought. Specifically, the following courses may be considered for waiver: Fin 516, Actg 550 and BA 522. A student can waive a maximum of 4 credit hours, thus reducing the required number of hours in the degree program. Students mustapply for waivers.

* See MSF programwebs ite for a list of approved electives. Other courses can qualify as elective credit if pre-approved by the Academic Director.


## GLOBAL SUPPLY CHAIN MANAGEMENT M.S. (MS GSCM)

The MS GSCM is a 45 -credit-hour programthat 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 theimplications 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 dimensions of supply chain strategy, social and environmental responsibility, innovation, transformation and organizational leadership.
The end goal of the MS GSCM is to prepare global leaders 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 <br> Technology Seminar | 1 |
| GSCM 511 | Principles of Strategic Global <br> Sourcing <br> Principles of Strategic Global | 4 |
| GSCM 513 | Logistics |  |
| GSCM 514 | Reverse Logis tics and Closed <br> Loop Supply Chain <br> GSCM 517 | Supply Chain InternationalField |
| GSCM 520 | Study <br> Global Supply Chain Strategy <br> GSCM 522 | 4 |
|  | Global Leadership andEthics in <br> Supply Chain Management | 2 |

GSCM 507 Global Supply Chain Digital 1 Technology Seminar Sourcing

Logistics Loop Supply Chain Study
Gobal Supply Chain Strategy

GSCM 525
Supply Chain Capstone
Consulting Experience
GSCM 573
New Product Introduction and Innovation

## Electives ( 16 credits)

Choose 16 credits from the following electives:
BTA 516 Multiple Regression with
Business Applications
BTA 520 Introduction to Business
Intelligence and Analytics
BTA 522 SpecialTopics in Data Science, 2
Technology for Business
BTA 523 SpecialTopics in Data Science, Machine Learning Applications for Managers
BTA Blockchain Fundamentals
581/BTA
581S
BTA
583/BTA
583S
GSCM $510 \quad$ SpecialTopics $\quad 1-8$
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 $560 \quad$ 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 Real Estate Development (MRED) is a profes sional 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 Administration and the Toulan Schoolof Urban Studies and Planning.

The objective forthis programis to provide a unique and exceptional graduate degree that will enable students to
assist in the development, managementand 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 for students who have gained at least two years of industry experience prior to their admis sion date. The MRED program is 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 W orkshop 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 W orkshop culminating experience.

| Sustainable Urban Development |  |  |
| :---: | :---: | :---: |
| USP 527 | Commercial District | 3 |
|  | Revitalization |  |
| USP 569 | Sustainable Cities and Regions | 3 |
| USP 612 | Community, Planning, and Ethics | 4 |
| Finance, Markets, and Law |  |  |
| RE 521 | Real Estate Financel | 4 |
| RE 522 | Real Estate Finance II | 4 |
| RE 573/USP | Real Estate Economics | 4 |
| 573 |  |  |
| RE | Real Estate Law I | 3 |
| 538S/USP |  |  |

## Project Development

| USP 523 | Real Estate DevelopmentI | 4 |
| :--- | :--- | :--- |
| 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 | 4 |
|  | Workshop |  |

Electives 15
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 teamthat produces a development proposal for a multi-
block site in a major city, advised by localindustry professionals. 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 professional. The foundation of the curriculumis the immersion of students in primary source authority, such as the Internal Revenue Code, Treasury regulations, and judicial and adminis trative authority. Skill development is focused on strengthening analytical, research, and written and oralcommunication skills. The programis des igned to develop the tax expertise of a wide range of students, including current undergraduate accounting majors with a 3.0 or higher GPA in their upper divis ion accounting courses, bachelor degree holders outs ide of accounting that complete a specified set of upper divis ion accounting courses with a 3.0 orhigher 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 coursebegins with a live on-campus class on a weekend at the start of 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 Researchand Writing | 4 |
| :--- | :--- | :--- |
| MTax 526 | Tax AccountingMethods and | 4 |
|  | Periods |  |
| MTax 527 | Corporate Taxation I | 4 |
| MTax 528 | Corporate Taxation II | 4 |
| MTax 530 | Taxation of Property | 2 |
|  | Transactions |  |
| MTax 531 | Pass-throughEntities I | 4 |
| MTax 532 | Pass-through Entities II | 2 |
| MTax 533 | Financial Accounting for Income | 4 |
|  | Taxes |  |
| MTax 537 | Tax Case Capstone | 3 |
| MTax544 | Professional Practices Seminar | 2 |

## Subtotal: 33 Credits

## TAX ELECTIVES*

Students will complete twelve credits fromthe following courses:

| MTax 535 | State and Local Taxation | 4 |
| :--- | :--- | :--- |
| MTax 536 | International Taxation | 4 |
| MTax 539 | Taxation ofEstates, 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 will help students prepare for careers in the A\&O industry or help themadvance 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. Industry professionals actively participate in the clas sroomas 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, or MSF. It can 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
Mktg 534
Advertising and Brand Management
Mktg
536/Mktg
536S
Mktg
537/Mktg 537S

## Electives*

Choose one course fromthe following:
GSCM 511 Principles of Strategic Global 4 Sourcing
GSCM 516 Global Supply Chain Forecasting 4
and Production Planning
ISQA 511 Sustainable Operations 4
Management
BTA $519 \quad 4$
Mktg 513 Pioneering Innovation 4
Enrollment in electives is based on space and availability.
*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 objectiveofthe Business Blockchain Certificate is to provide students with knowled ge ofblockchain and dis tributed led ger concepts and an understand ing of how these technologies can transformbus inesses and industries. The programwill equip students with the ability to 1) use analytical skills to address technical and business problems, 2) work with distributed ledger technologies, and 3) respond effectively to blockchain-related changes 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 |  |  |
| 582S |  |  |
| BTA | Blockchain in Business | 4 |
| 583/BTA |  |  |
| 583S |  | 2 |
| BTA | Blockchain in Business Lab |  |
| 584/BTA |  | 4 |
| 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 will provide students specialized knowledge concerning analyzing real estate investments, including core finance concepts, pro-forma modeling, valuation of real estate as sets, and assessment of market demand. The Certificate will prepare students for careers in corporate real estate, underwriting, investment analysis, and appraisalorvaluation.

## 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 |
| RE 523 | Real Estate Investment Analytics | 4 |
| RE 533/RE | Commercial Property and Asset | 4 |
| 533S | Management |  |
| USP 596 | Affordable Housing Finance | 3 |

Subtotal: 3-4

## Total Credit Hours: 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, analyze 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 organizations. 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, mathematical statistics, and businesscommunications.

| Courses |  |  |
| :--- | :--- | :--- |
| ETM 538 | Decision Support Systems:Data <br> Warehousing | 4 |
| ETM 540 | Operations Research | 4 |
| Stat 564 | Applied Regression Analysis | 3 |
| SySc 531 | Data Mining with Information <br> Theory | 4 |
| BTA 520 | Introduction to Business | 4 |
| BTA 521 | Intelligence and Analytics | Data Visualization |

Subtotal: 21
ETM 538, ETM 540, Stat 564, and SySc 531 may be taken in any order but are prerequisites for ISQA 520; ISQA 520 is a corequisite to ISQA 521.

## GLOBAL SUPPLY CHAIN MANAGEMENT GRADUATE CERTIFICATE

The GSCM certificate is designed as a standalone certificate for working profes sionals 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 <br> Sourcing | 4 |
| :---: | :--- | :---: |
| GSCM 513 | Principles of Strategic Global | 4 |
| GSCM 521 | Logistics <br> Global Information, Systems and <br> Data Analytics | 4 |

Subtotal: 12

## ELECTIVES

Choose one of the following:

| GSCM 517 | Supply Chain InternationalField <br> Study | 4 |
| :--- | :--- | :--- |
| GSCM 572 | Business Analytics II | 4 |
| GSCM |  | 4 |
| 5XX* |  |  |

Subtotal: 4

* Other GSCM course approved by the A cademic Director.

Total Credit Hours: 16
HUMAN RESOURCE ANALYTICS (HRA) GRADUATE CERTIFICATE

A growing number oforganizations use human resource analytics (HRA) to informand support strategy and to maintain a competitive advantage. Yet, a talent shortage has emerged, leaving many organizations 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 improve criticalorganizational 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 Introductionto HR Analytics 4
Mgmt 542 HR Analytics Tools and
Applications
Mgmt 543 HR Metrics and Analytics in Daily Operations
Mgmt 548 Special Topics in HRAnalytics
Mgmt 552 HR Analytics Capstone 4
Mgmt 553 HR Data Visualization and Storytelling
Subtotal: 18
Total Credit Hours: 18
REAL ESTATE DEVELOPMENT CERTIFICATE

Administered by the College of Urban andPublic Affairs (p. 371) (CUPA) A concentration centering on is sues of property development, financeand 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 social entrepreneur starting something new, or an intrapreneur inside a mission-driven organization, this programcan prepareyou with the
experience and skills to innovate. You can either design a new social venture-nonprofit, business, government programoradvocacy campaign-toaddress an is sue that matters to you, or evaluate and suggest improvements to an existing organization of your choice.

| Graduate Certificate Requirements |  |  |
| :---: | :---: | :---: |
| $\begin{aligned} & \text { Mgmt } \\ & 521 \mathrm{~S} / \mathrm{Mgmt} \\ & 521 \mathrm{~S} \end{aligned}$ | Design Thinking for Social | 4 |
|  | Innovation |  |
|  |  |  |
|  | And |  |
| Mgmt 522S | Money Matters for Social Innovation | 4 |
|  | or |  |
| PA 541 | Social Entrepreneurship | 3 |
|  | or |  |
| Mktg 513 | Pioneering Innovation | 4 |
|  | And |  |
| Mgmt 523S | Storytelling and Impact | 4 |
|  | Measurement for Social |  |
|  | Innovation |  |
|  | And |  |
| Mgmt 509S | Social Innovation Practicum | 4 |
|  | or |  |
| PA 509 | Organizational Experience | 1-6 |
|  | or |  |
| PAH | Practicum | 1-6 |
| 509/HSMP |  |  |
| 509 |  |  |
|  | or |  |
| BA 525 | Capstone Consulting Project | 2 |

Subtotal: 27-41

## TAXATION GRADUATE CERTIFICATE

The Graduate Certificate in Taxation (GCT) allows accounting majors, and current practitioners, the opportunity to further their tax education. This program is 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 taxprofessionals 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 res earch 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

MTax 525 Tax Research and Writing
4
Electives (select 16 credits)
MTax 526 Tax Accounting Methods and 4 Periods
MTax 527 Corporate Taxation I 4
MTax 528 Corporate Taxation II 4
MTax 530 Taxation ofProperty 2
Transactions
MTax 531 Pass-through Entities I 4
MTax 532 Pass-through Entities II 2
MTax 533 Financial Accounting for Income 4 Taxes
MTax 535 State and Local Taxation 4
MTax 536 International Taxation 4
MTax 539 Taxation ofEstates, Gifts, and 4
Trusts
Actg $553 \quad$ Financial Statement Analysis 4

## College of Education

Jose Coll, Interim Dean
Tina Anctil, AssociateDean for Academic Affairs
1900 Fourth Avenue Building, Suite 200, 503-725-4619
www.pdx.edu/education

## Graduate Programs

- Initial and Continuing Licenses
- Early Childhood Education
- Elementary Education
- Middle LevelEducation
- High SchoolEducation-In cooperation with appropriate departments
- Specialist Programs—Administrative Studies (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 candidates 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 Oregon 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 theTSPC during the life of this catalog may alter the requirements. Applicants for licenses must meet the TSPC requirements in force at the time of the license application. $\dagger$
$\dagger$ Because licensure rules are controlled by the Oregon Teacher Standards and Practices Commission, it is possible that licensure requirements may change. All persons
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 trans formative 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 pursuing a career in teaching should refer to the "Teacher Preparation (p.310)" 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 the Freshman or Sophomore years (Yr $1 \& 2$ ).

| Mth 211 | Foundations Of Elementary <br> Mathematics I | 4 |
| :--- | :--- | :--- |
| Mth 212 | Foundations Of Elementary | 4 |
| SpEd 418 | Mathematics II | Survey of Exceptional Learners |$\quad 3$

These requirements are completed in Junior and Senior years (Yr 3 \& 4).
SpEd 411 Foundations of Specia 3

Education
SpEd 415 ClassroomAssessment, Instruction, and Behavior Management(Elementary)
SpEd 430 Families and Advocacy
SpEd 409 Professional Practices Seminar 1
SpEd 437 Reading Assessment and 4
Instruction-Elementary
SpEd 438 Reading Assessment and 4

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
School Year
SpEd 433 Math Assessment and Instruction 3
SpEd 422 Comprehensive Individualized 3
AssessmentandCurriculumI
SpEd 409 Professional Practices Seminar 2
SpEd 423 Comprehensive Individualized 3
SpEd 425 StudentTeaching 12
SpEd 426 IEP and Collaborative Teaming 4

## Subtotal: 64

## 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, career development/employment, and social/community engagement experiences. Each student's CCS certificate programofstudy begins with a pers on-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) forcollege courses, academic coaching, career development and employment supports, etc.) andc) 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 social engagement with in theircommunities are the anticipated outcomes after certificate completion. The CCS certificate culminates in an ePortfolio summarizing the student's academic and career/employmentexperiences and competencies.

Admission to this program is 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 |  |  |
| :---: | :---: | :---: |
|  | Freshman Inquiry | 15 |
| SpEd 120 | Career and Community Studies | 6 |
|  | First Year of Study |  |
|  | Subtotal: 21 |  |
| Year 2 |  |  |
| SpEd 220 | Career and Community Studies | 6 |
|  | Second YearofStudy |  |
|  | Courses thatsupport career and other interests | $\begin{array}{r} 12- \\ 18 \end{array}$ |
|  | Subtotal: 18-24 |  |
| Year 3 |  |  |
| SpEd 320 | Career and Community Studies | 6 |
|  | Third Year of Study |  |
|  | Courses that support career and other interests | $\begin{array}{r} 12- \\ 18 \end{array}$ |
|  | Subtotal: 18-24 |  |
| Year 4 |  |  |
| SpEd 420 | Career and Community Studies | 6 |
|  | Fourth YearofStudy |  |

Courses that support career and 12other interests

Subtotal: 18-24
Subtotal: 75-93
Total Credit Hours: 75-93

Graduate programs

## ADMISSION REQUIREMENTS

To be admitted to a graduate programin professional education, the applicant must first satisfy minimum University requirements (p.41). The applicantmust also meet the admiss ion requirements of specific degree, license, or specialist programs that the school is authorized to offer. Detailed information regarding admission 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.51). Specific College of Education requirements for degree, educational specialists, or license candidates are listed below. Upon successful completion of all University and College of Education requirements, the candidate 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 programsatis fies University and College of Education requirements and is part of the requirements needed prior to taking the NCE examination of the National Board forCertified Counselors (NBCC) or the CRC examination of the Commis sion on Rehabilitation Counselor Certification (CRCC). This program is also approved by the Oregon Board of Licensed Professional Counselors and Therapists and the Teacher Standards and Practices Commission of Oregon. Students should work with their advis ers 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 behavioral health 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,
interpers onal 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 Mental Health 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) thesis, or (c) professional portfolio (forschool counseling students only). Thesis credits are in addition to the required credits for graduation. The thesis mustbe no less than 6 credits and nomore 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 SchoolCounseling specialization (see "Licensure (p. 146)"). Courses numbered 808 are not allowed.

## Core cours es ( 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 $570 \quad$ Ethical and Legal Issues in 3
Coun 571 Group Counseling 3
Coun 580 Supervision 1
Coun 581 Multicultural Perspectives in 3
Coun 582 Research and Program 3
Evaluation in Counseling
Coun 585 Diagnos is and Treatment

## Clinical Mental Health Couns eling Specialization

The Clinical Mental Health Counseling specialization prepares individuals to work as counselors in a range of private and public clinical mentalhealth settings, including outpatient and inpatient treatment agencies, community
mentalhealth, 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 programofstudy 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

| Coun 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 ofCouples, 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 | Diagnos is and Treatment Planning II |
|  | Electives |
| Coun 584 | Crisis Assessmentand Intervention |

Subtotal: 90

## Clinical Rehabilitation Couns eling Specialization

Clinical Rehabilitation Counselors provide services to individuals with disabilities who are psychologically and vocationally adjusting to the dis ability experience. The Clinical Rehabilitation Counseling programprepare graduates to work in a wide variety ofclinical 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, advanced theory and practice courses, and a culminating half-time field internship placement. Our program consists of 90 graduate credits designed to meet CACREP national accreditation standards for professional counselors and the academic degree requirements to become licensed as a Licensed Professional Counselor (LPC) in Oregon and other states.

Courses

|  | Core coursework | 56 |
| :---: | :---: | :---: |
| Coun 552 | Theories and Interventions II | 3 |
| Coun 575 | Foundations of Couples, Marriage, and Family Counseling | 3 |
| Coun 586 | Psychopharmacology and Mental Illness | 3 |
| Coun 588 | Diagnos is and Treatment Planning II | 3 |
| Coun 590 | Foundation ofRehabilitation Counseling | 3 |
| Coun 591 | Medical Aspects ofDisability | 3 |
| Coun 592 | PsychosocialAspects of Disability | 3 |
| Coun 593 | Case Management | 3 |
| Coun 594 | Occupational | 3 |
|  | Analysis/Vocational Evaluation |  |
| Coun 595 | Contemporary Is sues and | 3 |
|  | Applications in Rehabilitation |  |
|  | Counseling |  |
|  | Elective | 4 |

Subtotal: 90

## Marriage, Couple, and Family Couns eling 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, andadditional settings. The programleads to an M.A./M.S. in Counselor Education with specialty in Marriage, Couple, and Family 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 onHuman ..... 3Sexuality
Coun 573 Contemporary Couples, ..... 3
Marriage, and Family Systems

Coun 574 Family Life Cycle and Transitions
Coun 575 Foundations of Couples, 3 Marriage, and Family Counseling
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 | Diagnosis and Treatment <br>  <br> Clanning II | 3 |
| Coun 544 | Consultation: Theory and <br> Cractice | 2 |
| Coun 546 | Grief and Loss | 2 |
|  |  | Subtotal: 90 |

## School Counseling Specialization

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 mustcomplete a 6 -credit, 200- hour Effective Teaching sequence to obtain licensure as a school counselor (see "Licensure (p. 153)") (Track II).

## Courses

| Coun 526 | Core coursework <br> Effective Teaching (Track I, 0 <br> cr.; Track II, 6 cr.) | 56 <br> 0 or |
| :--- | :--- | ---: |
| Coun 527 | Counseling Individuals with | 6 |
|  | Diverse Needs | 3 |
| Coun 545 | Youth at Risk | 3 |
| Coun 546 | Grief and Loss | 2 |
| Coun 547 | Legal \& Ethical Issues in School | 1 |
|  | Counseling |  |
| Coun 555 | Counseling Children and Youth | 3 |
| Coun 575 | Foundations of Couples, | 3 |
|  | Marriage, and Family |  |
| Counseling |  |  |
| Coun 576 | Carents, Families, and | 3 |
|  | Communities in Schools | 3 |
| Coun 589 | Action Research in Counseling | 5 |
|  | Foundations of School | 3 |
|  | Counseling |  |
| 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 programof study consisting of 45 graduate-level credits approved by the student's graduate adviser and the departmentchair, to include:
a. A minimum of 24 core credits in curriculum and instruction.
b. A core ofstudies encompassing preparation in the areas of teaching and learning, curriculum, research and evaluation, human relations, and multicultural education. The precise nature of this core ofstudies is specified by the department. Degree plans are written in cooperation with an as signed adv iser.
c. All courses must be 500 level or above.
d. No more than 6 credits may be 800 -level courses numbers, if approved by theadviser 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 trans ferred 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 three options to complete the requirements for the master's degree: (1) an independentaction research project, (2) a thes is, or (3) a written comprehensiveexamination. The thesis requires an oral examination in addition to the written product.

| Core Classes | (24credits) |  |
| :---: | :--- | :---: |
| CI 510 | Guidance forthe Classroom <br> Teacher | 3 |
| CI 561 | Advanced Educational <br> Psychology | 3 |
| CI 565 | Theoretical Models of <br> Curriculum | 3 |
| CI 567 | Curriculum and Culture | 3 |
| CI 580 | Theories of Instruction | 3 |
| CI 581 | Issues in Education |  |
| CI 590 | Action ResearchProposal | 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 cours ework 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 programemphasizes educating professionals to welcome multiple perspectives, engage all members of the community, experiment and build theories, make learning and listening vis ible, and think deeply together. Students develop a criticalunderstanding 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 Toddler Mental Health, and a Distributed 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.

| General requirements <br> Core Courses <br> ECED 550 | Foundations in Early Childhood <br> and Inclus ive Education | 4 |
| :--- | :--- | ---: |
| ECED 551 |  |  |
| Child Development in Early |  |  |
| Childhood and Inclusive |  |  |$\quad 4$


| ECED 577 | Learning Designs:Early <br> Childhood Environments <br> Constructivist Curriculum: Big | 3 |
| :--- | :--- | :---: |
| ECED 578 | Ideas in Early Childhood <br> Education |  |
| ECED 579 | Young Child as Scientist <br> or <br> Language and Literacy in Early <br> Childhood Education | 3 |
| ECED 572 | 3 |  |

Subtotal: 18
Early Childhood Special Ed
Courses
ECED 510 Educational Rights and Inclusive 3 Environments in Early Childhood
ECED 560 Inclusive Early Childhood 3
Models
SpEd 580 Introduction to Early 3
Intervention/Early Childhood Special Education
SpEd 581 Family Guided Early 3
Intervention
SpEd 582 Specialized Techniques: Early
Intervention/Early Childhood Special Education
SpEd 587 Introduction to Infant Toddler 3
MentalHealth
Subtotal: 18

## Infant Toddler Mental Health

| Courses <br> SpEd 587 | Introduction to Infant Toddler <br> MentalHealth <br> or <br> Anothercourse with advis or <br> approval | 3 |
| :--- | :--- | ---: |
| Coun 520 | Collaborative Partnerships to | $1-3$ |
| ECED 585 | Support Infants and Toddlers <br> Dynamic Models of <br> Infant/Toddler Development | 3 |
| SpEd 594 | Assessment Methods and <br> Classification in Infant Mental | 3 |
| SpEd 595 | Health <br> Prevention and Intervention in <br> Infant Mental Health <br> Strenths, Risk Factors, and <br> Disturbance in Infants, Toddlers, <br> and Their Families | 3 |

## DistributedFocus

Take a minimum of two courses fromeach strand 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-wideMaster of Arts and Master of Science degree with specializations in:Postsecondary, Adult, and Continuing Education (PACE); Leadership in Sustainability Education (LSE); and Educational Administration, Initial Adminis trator License/ Preliminary Administrative License (MS/MA+IAL).

The purpose of these programs is to inspire and guide educational leaders in creating a socially just world. Throughteaching, research and advocacy, the ELP department inspires 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 advisers, a general programor theme (special emphasis or focus).

| Core Courses (16 credits) |  |  |
| :--- | :--- | :--- |
| ELP 511 | Principles of Educational <br> Research and Data Analysis I <br> Developmental Perspectives on | 4 |
| ELP 520 | Adult Learning |  |
| 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 adviser, 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 degreecompletion. Further information about each of these areas of specialization may be obtained from the Graduate School of Education. For more information please vis it our web site at www.pdx.edu/elp/.

Information about specific specializations and licensure programs can alsobe found on our website.

MA/MS Postsecondary Adult and Continuing Education
MA/MS Leadership for Sustainability Education

Educational Administration:

- Initial Adminis trative Licensure / Preliminary Administrative Licensure
- MA/MS+Initial Adminis trative Licensure / Preliminary Administrative Licensure
- Continuing Administrative Licensure / Professional Administrative Licensure


## Graduate Certificates

- Teaching Adult Learners (p. 145)
- Student Affairs in Higher Education (p. 143)
- Service-Learning and Community-Based Learning in Higher Education (p. 143)
- Training and Development (p. 145)


## 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 complete the 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 programorother 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 SignificantDisabilities are offered. Students must fulfill a capstone experienceby 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:

| Advisor approved courses (from | $30-$ |
| :--- | ---: |
| licensure programor electives) | 36 |

SpEd 596 Topics in SpecialEducation 3 Research
SpEd 597 Topics in SpecialEducation Issues and Practices

A combination of the following:

| SpEd 503 | Thes is | $6-9$ |
| :--- | :--- | :--- |
| or | SpEd 506 | Special Project |

## 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 $\operatorname{SpEd} 596, \operatorname{SpEd} 597$, an additional 6 elective hours in special education AND complete a proctored, written master's comprehensive examination.
For students with a focus on Visually Impaired Learners completing the master's degree programincludes:

Advis or approved courses (from licensure programorelectives)
Option 1:

SpEd $596 \quad$| Topics in Special Education |
| :--- |
| Research |

SpEd 597 Topics in Special Education Issues and Practices
A combination of the following:

| SpEd 503 | Thesis | 6-9 |
| :--- | :--- | :--- |
| SpEd 506 | Special Project | 3-6 |

Option 2:
Electives with advis or approval
Complete proctored master's
comprehensive examination

## Inclusive Elementary Educator Program

Students completing the Master's programas part of the Inclus ive Elementary Educator Programmust satisfy the special education Master's core programrequirements by completing the required courses as follows:
Ed 530 Introduction to Inclusion and
SpecialEducation

Ed 536

SpEd 506
SpEd 503

## EDUCATION M.ED.

The M.Ed. is earned by students who have completed PSU's Graduate Teacher Education Program(p. 146)
(GTEP) or Secondary Dual Educator Program(p. 149) (SDEP). Graduate level students in the Bilingual Teacher Pathway (p. 151) (BTP) Programmay earn the M.Ed. with the completion of a research course to be approved by their advis or as equivalent to the former course CI 563: Teacher as Researcher. ITEP students may earn a M.Ed. with completion of coursework approved by their advisor.

Requirements listed below are for the M.Ed. only. Please refer to the licensure 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 <br> Justice | 3 |
| ITP 534 | Foundations of Culturally and <br> Linguistically Responsive <br> ITP 536 | Practice at the Elementary Level <br> Learning and Development |
| ITP 538 | Integrated Methods <br> ITP 540 | Foundations of Literacy <br> ITP 541 |
| Literacies in the Elementary <br> Classroom | 4 |  |
| ITP 542 | Integrated Elementary Science <br> Methods <br> Cultivating Responsive | 4 |
| ITP 535 | Elementary Classrooms |  |
| ITP 537 | InstructionalDesign and <br> Assessment | 1 |
| ITP 539 | Elementary Mathematics <br> Methods | 8 |
| ITP 543 | Professional Collaboration in <br> Elementary Education | 4 |

## SECONDARY EDUCATION

Ed 519 Inclusive Secondary Clas srooms 3
ITP 516 Engaging Young Adolescent 3
Learners
or
ITP 517
Engaging AdolescentLearners



| 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 |
|  | Justice |  |
| 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 | 3 |
| ITP 551 | Research andClassroom Inquiry | 5 |
| ITP 509 | Practicum | 3 |

Subtotal: 45
SECONDARY DUAL EDUCATION PROGRAM

| Ed 507 | Seminar |  |
| :---: | :---: | :---: |
| Ed 581 | Inclusive ClassroomResearcher | 2 |
| Ed 583 | Study Skills and Learning | 2 |
|  | Strategies |  |
| Ed 585 | Instructional Planning for | 3 |
|  | Inclusive Classrooms |  |
| Ed 586 | Collaborative Teaching | 2 |
| Ed 587 | Inclusive Educational Research and Leadership | 2 |
| CI 543 | Effective Tchg Strategies \& |  |
|  | Materials for W orking with |  |
|  | Linguistically \& Culturally |  |
|  | Diverse Stdnts |  |
| ITP 511 | ClassroomManagement for | 2 |
|  | StudentSuccess |  |
| ITP 512 | Learning and the Learner |  |
| ITP 514 | Educating for Equity and Social |  |
|  | Justice |  |
| SpEd 513 | ClassroomBased Assessment and Instructional Planning | 3 |
| SpEd 548 | Positive Behavior Support in the | 3 |
|  | Classroom |  |
| SpEd 528 | Instructional Methods I: Literacy |  |
|  | (Midlevel/High School) |  |
| SpEd 529 | Instructional Methods II: Math | 3 |
|  | and Content Instruction (Midlevel/High School) |  |
| SpEd 571 | Adolescents with Learning | 2 |
|  | Differences |  |
| ITP 521-528 | Secondary Methods | 8 |

Subtotal: 45

## BILINGUAL TEACHER PATHWAY ELEMENTARY

| CI 596 | Second Language Acquisition and Development for K-12 | 3 |
| :---: | :---: | :---: |
|  | Educators |  |
| CI 597 | AssessmentofLanguage and | 2 |
|  | Content Learning for $\mathrm{K}-12$ |  |
|  | English Learners |  |
| ITP 513 | Technology as a Tool for | 3 |
|  | Learning |  |
| ITP 539 | Elementary Mathematics | 3 |
|  | Methods |  |
| ITP 542 | Integrated Elementary Science | 2 |
|  | Methods |  |
| 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 | 3 |
| ELP 567 | ESL/Bilingual Program Design and Models | 3 |
| SpEd 555 | W orking With LEP Children | 2 |
|  | Who Have Special Needs |  |
| CI 543 | Effective Tchg Strategies \& | 3 |
|  | Materials forWorking with |  |
|  | Linguistically \& Culturally |  |
|  | Diverse Stdnts |  |
| ITP 511 | ClassroomManagement for | 3 |
|  | StudentSuccess |  |
| ITP 512 | Learning and the Learner | 3 |
| ITP 538 | Integrated Methods and | 5 |
|  | Curriculum Design |  |
| ITP 551 | Research and Clas sroomInquiry | 4 |
|  |  | Subtotal: 54 |
| BILINGUAL TEACHER PATHWAY SECONDARY |  |  |
|  |  |  |
| CI 596 |  |  |
|  | Second Language Acquisition | 3 |
|  | and Development for K-12 |  |
|  | Educators |  |
| CI 597 | AssessmentofLanguage and | 2 |
|  | Content Learning for K-12 |  |
|  | English Learners |  |
| ITP 513 | Technology as a Tool for | 3 |
|  | Learning |  |


| ITP 516 | Engaging Young Adolescent Learners or |
| :---: | :---: |
| ITP 517 | Engaging AdolescentLearners |
| ITP 552 | Reflective Practitioner |
| BBE 534 | Planning, Assessment, and Curriculum |
| BBE 524 | Professional Developmentand Reflection |
| BBE 532 | Language and Literacy Development for Diverse Learners |
| ELP 565 | ELL SchoolCommunity Relations |
| ELP 566 | Impact of Language and Culture in the Classroom |
| ELP 567 | ESL/Bilingual Program Design and Models |
| SpEd 555 | Working With LEP Children Who Have Special Needs |
| CI 543 | Effective Tchg Strategies \& Materials for Working with Linguistically \& Culturally Diverse Stdnts |
| ITP 511 | ClassroomManagement for StudentSuccess |
| ITP 512 | Learning and the Learner |
| ITP 521-528 | Secondary Methods |
| ITP 551 | Research and ClassroomInquiry |

Subtotal: 55

## INTERNATIONAL TEACHER EDUCATION PROGRAM ELEMENTARY

| ITP 540 | Foundations ofLiteracy | 4 |
| :--- | :--- | ---: |
| ITP 539 | Elementary Mathematics | 4 |
|  | Methods |  |
| Ed 518 | Inclusive Elementary Clas srooms | 2 |
| ITP 514 | Educating for Equity and Social | 3 |
| ITP 537 | Justice <br> Instructional Design and 4  <br>  Assessment  <br>  Electives 28 l |  |

Subtotal: 45
INTERNATIONAL TEACHER EDUCATION PROGRAM SECONDARY

ITP $514 \quad$ Educating for Equity and Social Justice<br>ITP 515 Foundations ofCulturally and<br>Linguistically Responsive<br>Practice at the Secondary Level

| Ed 519 | Inclusive Secondary Clas srooms | 3 |
| :--- | :--- | ---: |
| ITP 518 | Assessment for Learning | 2 |
| ITP 521-528 | Secondary Methods | 6 |
|  | Electives | 28 |

Subtotal: 45

## 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 divers e 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 anduniversities; 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 StateUniversity 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 | $1-4$ |
| Ed 630 | Principles and Practices of | 4 |
| Ed 640 | Learning <br> Organizational and Leadership <br> Theory and Research in | 4 |
| Ed 650 | Education |  |
| Ed 660 | Educational Policy and Politics <br> Foundations of Research <br> Ed 661 | Paradigms and Methods <br> Qualitative Research Methods in |
| Ed 662 | Education <br> Quantitative Research Methods | 4 |
|  | 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
- Postsecondary Education
- Special and Counselor Education


## Comprehensive Examination

The comprehensive examination covers the leadership core and is taken when thestudent 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 originaland independent inquiry that is a contribution to knowledge or 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 analyses, 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 requirement after admission to the doctoral program. Residency can be satis fied in one of the two following ways:

- Three terms offull-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 includesummer 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 cours ework, the study of practice (i.e., field-based work), credits by arrangement, and/or dissertation credits. This may includeone or more summer term.


## 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 $B C B A ®$, the Association for Behavior Analysis International (ABAI) has verified our7course sequence toward the coursework requirements for eligibility to take the Board Certified Behavior Analyst ${ }^{\circledR}$ examination. Applicants will need to meet additional requirements before they can be deemed eligible to take the examination. Please refer to the $B A C B ®$ (bacb.com) for additional requirements.

## REQUIRED COURSES:

| SpEd 558 | Concepts and Principles of <br> Applied Behavior Analysis | 5 |
| :--- | :--- | :--- |
| SpEd 559 | Assessing Behavior | 5 |
| SpEd 561 | PBS: Behavior-Change <br> Strategies | 5 |
| SpEd 562 | Ethical Issues in Applied <br> Behavior Analysis <br> SpEd 565 | Single-Subject Research Design <br> in Applied Behavior Analysis |
| SpEd 566 | Advanced Research Methods in | 5 |
| SpEd 567 | ABA <br> ABA Leadership Capstone | 3 |

Total Credit Hours: 32

## INFANT TODDLER MENTAL HEALTH CERTIFICATE

The graduate certificate in Infant/Toddler Mental Health: A Relationship-Based Approach is designed for professionals 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 supervisors of these direct-service providers.

## DEGREE REQUIREMENTS

Programof Study

ECED 585 Dynamic Models of Infant/Toddler Development
Coun 597 Strengths, Risk Factors, and Disturbance in Infants, Toddlers, and Their Families

SpEd 594
AssessmentMethods and Classification in Infant Mental Health
SpEd 595 Prevention and Intervention in Infant Mental Health
Coun 507 Professional Development in Infant Mental Health
Coun 520 Collaborative Partnerships to
Support Infants and Toddlers
Subtotal: 20
Subtotal: 20
Total Credit Hours: 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 Special Education Master's Degree (p. 138).

## REQUIREMENTS

| SpEd 540 | Foundations ofEducation for the | 3 |
| :---: | :---: | :---: |
|  | Visually Impaired Learner |  |
| SpEd 541 | Implications of Vision Problems of Children/Youth | 3 |
| SpEd 545 | Introduction to Orientation and Mobility and Independent Living Skills | 3 |
| SpEd 549 | Orientation and Mobility Methods | 3 |
| SpEd 550 | Orientation and Mobility Assessmentand Instruction Children | 3 |
| SpEd 551 | Orientation and Mobility Assessmentand Instruction Adults | 3 |
| SpEd 552 | Orientation and Mobility Advanced Techniques 12 credits of SpEd 554 Orientation and Mobility Practicum | 4 12 |
| Students co (O\&M) prac O\&M exper O\&M pract 3-12 credit upon the pr a supervisin (COMS). Th students to geography, partners wit settings. Stu | lete 12 credits ofOrientation and M umwhich is equal to 400 hours of ce that align with ACVREP require mcredits are variable and may be ta ements across multiple terms depen icumplacement hours and the availa Certified Orientation and Mobility S O\& ProgramCoordinator works nge practicumplacements based on dent interests, and availability of cli educational, rehabilitation and com nts are eligible to sit for the national | ts. <br> in <br> y of <br> alist <br> nity |

certifying exam for Orientation and Mobility Specialists within 6 months of completing of coursework. A person may be certified after passing the national exam, submitting documentation of coursework completion, and with a signed documentation from the Program Coordinator.
Total Credit Hours: 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

| Programof Study (12 credits) |  |  |
| :---: | :---: | :---: |
| ELP 542 | Introduction to Service-Learning: | 4 |
|  | Theoretical \& Pedagogical |  |
|  | Perspectives in Postsecondary Education |  |
| ELP 543 | Service-Learning \& Community | 4 |
|  | Based Learning in Postsecondary |  |
|  | Educational Leadership \& Policy |  |
|  | Dom |  |
| ELP 522 | Teaching Diverse Adult Learners | 4 |
|  | or |  |
| ELP 536 | Postsecondary Curriculum | 4 |
|  | or |  |
| ELP 528 | Leadership in Postsecondary | 4 |
|  | Education |  |
| 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 currentofferings and deliveryformats (online, hybrid, F2F). |  |  |
|  |  |  |

Subtotal: 18
Total Credit Hours: 18
STUDENT AFFAIRS IN HIGHER EDUCATION CERTIFICATE

Provides professional development for individuals in student affairs and student services positions in two and four-year colleges ( 18 credits).

## REQUIRED COURSES

| Program of Study (12 credits) |  |  |
| :---: | :---: | :---: |
| ELP 525 | StudentServices in Higher | 4 |
|  | Education |  |
| ELP 526 | Facilitating StudentSuccess in | 4 |
|  | Postsecondary Education |  |
| ELP 527 | Legal Issues in Higher 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 currentofferings and deliveryformats (online, hybrid, F2F). |  |  |

Subtotal: 18
Total Credit Hours: 18

## SUSTAINABLE FOOD SYSTEMS GRADUATE CERTIFICATE

The Food Systems certificate utilizes a "Certificate Outcomes" approach, an innovative curriculummodel that 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 independentstudy may also be pursued with approval from the 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 epis temologies/traditions/ways of knowing, that exist in the sustainable food systems movement.
Geog 549 Geography ofFood

GSCM
532/GSCM
532S
Hst 592
PHE 510
PHE 522

Craft Beverage Operations
Management
Research in World History:
World ofCommodities
Stres s, Food, \& Health
Health and Social Inequalities

## 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 ofFood 4
Hst 592 Research in World History: 4
World of Commodities
PHE 522 Health and Social Inequalities 3
Soc510 Food, Justice, and Social 4
Soc $579 \quad$ 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-bas ed 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 beachieved 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
4
Systems Design
ELP 540
Urban Farm Education:
4
Leveraging Policy and Research
to Cultivate Garden-Based
Education in Practice

## 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 and cross-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:
Leveraging Policy and Research

|  | to Cultivate Garden-Based |  |
| :--- | :--- | :--- |
|  | Education in Practice |  |
| ELP 548 | Global Political Ecology | 4 |
| ESM 527 | Watershed Biogeochemistry | 4 |
| Geog 549 | Geography of Food | 4 |
| PA 574 | Food and Agriculture Policy | 3 |
| PHE 510 | Stres Food, \& Health | 4 |
| SySc 513 | Holistic Strategies for Problem | 4 |
|  | Solving |  |
| USP 542 | Land Use Implementation | 3 |
| USP 568 | Oregon Land Use Law | 3 |

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 |  |
| 532S |  |  |
| 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 | Feeding the City |
|  | Feemplation | 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 for Nonprofit | 3 |
| :--- | :--- | :--- |
| PHE 517 | Organizations <br> 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 ofdiverse 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 Adult Learning | 4 |
| ELP 521 | Adult Learning and Motivation |  |
| ELP 522 | Teaching Diverse Adult Learners | 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 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 $\mathbf{7}$ credits) |  |  |
| :---: | :--- | :---: |
| ELP 529 | Principles ofTraining and <br> Development | 3 |
| ELP 530 | Course Designand Evaluation <br> 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 |
|  | or | 2 |
| ELP 509 | Practicum | 2 |

## Recommended Elective 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 theirstatus as programcompleters. Once all criteria are met, candidates can then be recommended to Teacher Standards and Practices Commis sion(TPSC) for an educator license. Assessments during a programinclude subject matter test(s), a civilrights 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 whomtests or assessments present a barrier to programcompletion. Each licensure programin the COE has processes forutilizing 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 programis 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 TeacherStandards and Practices Commission for a teaching license. Specific programadmiss ion requirements and application details are available at
www.pdx.edu/ci/gtep-info.
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 BilingualTeacher Pathway (BTP) Program may earn the M.Ed. with the completion of ITP 551 Research and ClassroomInquiry.
PROGRAM REQUIREMENTS

| GTEP Elementary |  |
| :---: | :---: |
| Ed 518 | Inclusive Elementary |
|  | Classrooms |
| ITP 514 | Educating for Equity and Social Justice |
| ITP 534 | Foundations ofCulturally and |
|  | Linguistically Responsive |
|  | Practice at the Elementary Level |
| ITP 535 | Cultivating Responsive |
|  | Elementary Classrooms |
| ITP 536 | Learning and Development |
| ITP 537 | Instructional Design and |
|  | Assessment |


| ITP 538 | Integrated Methods | 4 |
| :--- | :--- | ---: |
| ITP 539 | Elementary Mathematics | $1-4$ |
| Methods 540 | Foundations of Literacy | 4 |
| ITP 541 | Literacies in the Elementary <br> Clas | 4 |
| ITP 542 | Integrated Elementary Science <br> Methods | 2 |
| ITP 543 | Professional Collaboration in <br> Elementary Education | $1-3$ |
| ITP 545 or | Student Teaching I | $3^{*}$ |
| 548 546 or | Student Teaching II | $6^{*}$ |
| ITP  <br> ITP 547 or Student Teaching III | $12^{*}$ |  |
| 550 |  |  |

Subtotal: 45-66
*required for licensure but may not be applied to M.Ed.
8 credits of ITP 537, 4 credits ofITP 539, 6 credits of ITP 543 , and 3 credits of ITP 535 are required for the degree.

Total 66 credits for license
Total45 credits forM.Ed.
GTEP Secondary

| ITP 509 | Practicum | 3 |
| :---: | :---: | :---: |
| ITP 511 | ClassroomManagement for | 3 |
|  | StudentSuccess |  |
| ITP 512 | Learning and the Learner | 3 |
| ITP 513 | Technology as a Tool for | 3 |
|  | Learning |  |
| ITP 514 | Educating for Equity and Social | 3 |
|  | Justice |  |
| ITP 515 | Foundations of Culturally and | 3 |
|  | Linguistically Responsive |  |
|  | Practice at the Secondary Level |  |
| 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 521- | Secondary Methods | 10 |
| 528 |  |  |
| ITP 529 | Professional Seminar-Secondary | 1 |
| ITP 530 or | Student Teaching I | 8* |
| 532 |  |  |
| ITP 531 or | Student Teaching II | 13* |
| 533 |  |  |
| ITP 551 | Research and Clas sroomInquiry | 1-4 |
| Ed 519 | Inclusive Secondary Clas srooms | 3 |

*required for licensure but may not be applied toM.Ed.
Total 66 credits for license
Total45 credits forM.Ed.
Secondary education at Portland State University is available in the following endorsementareas: art, biology, chemistry, world languages, health education, integrated science, language arts, mathematics, music, physical education, physics, and socials tudies. Initial subject matter endorsement requirements are outlined in the appropriate departmentsection ofthis catalog.

MATHEMATICS INSTRUCTIONAL LEADER: PREK-8 SPECIALIZATION

The Mathematical Instructional Leader: Pre-K 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 mathematical content knowledge including the specialized knowledge needed for teaching mathematics and the developmentofmathematical ideas across the grades.
-
Attends to both content and pedagogy and the ways that teaching supports the learning of content.
-
Develops expertise in using and helping others use effective instructional practices centered on students' mathematical thinking.
-
Increases ability to support school and dis trict efforts that help all students learn important mathematics.

Upon completion of the PreK-8 Specialization, program completers are eligible for recommendation to TSPC to add the specialization to their license. Per TSPC, "A specialization is distinguished froman 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."

## REQUIREMENTS

## PreK-Grade 8 program

| Mathematics | LeadershipFocused Courses <br> CI 519 | Mathematics Leadership: <br> Influencing and Facilitating |
| :---: | :---: | :---: |
|  | Improvement |  |
| CI 521 | Practicum: Mathematics <br> Leadership | $1-3$ |

If desired, the graduate cred it received can be applied toward an M.A., M.S., or Ed. D. in the Department of Curriculum and Instruction in the GraduateSchool of Education.

For more information see:
http://www.pdx.edu/ci/deepening-math
Advanced Mathematics Methods Course

$$
\begin{aligned}
& \text { CI } 518 \quad \begin{array}{l}
\text { Implementing Mathematics } \\
\text { Reform }
\end{array} \\
& \text { Educators seeking the 21-credit Certification of } \\
& \text { Completion in Deepening Understanding of Elementary } \\
& \text { Mathematics may choose to either complete CI 519 or } \\
& \text { select a sixth Mathematics Content-Focus Methods Course. } \\
& \text { Those seeking the24-credit Elementary Mathematics } \\
& \text { Instructional Leader Specialization complete both CI } 519 \\
& \text { and CI 521. }
\end{aligned}
$$

Mathematics Content-Focus ed Methods Cours es

| (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 <br> CI 513 | Enhancing Algebraic Thinking: <br> Generalization about Operations |
| CI 514 | Enhancing Algebraic Thinking: <br> Patterns and Functions | 3 |
| CI 515 | Developing Geometric Thinking <br> and Concepts | 3 |
| CI 516 | Exploring Measurement <br> Concepts | 3 |
| CI 517 | Developing Concepts ofData <br> Analysis | 3 |

## MATHEMATICS INSTRUCTIONAL LEADERGRADES 6-12 SPECIALIZATION

The Mathematical InstructionalLeader: Grades 6-12 Programin the College of Education consists 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 mathematical content knowledge including the specialized knowledge needed for teaching mathematics and the developmentof mathematical ideas across the grades.
-
Attends to both content and pedagogy and the ways that teaching supports the learning of content.
-
Develops expertise in using and helpingothers use effective instructional practices centered on students' mathematical thinking.
-
Increases ability to support school and dis trict efforts that help all students learn important mathematics.

Upon completion of the Grades 6-12 Specialization, programcompleters are eligible forrecommendation to TSPC to add the specialization to their license. Per TSPC, "A specialization is distinguished froman 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."

## DEGREE REQUIREMENTS

(choose three + )
Mathematics Content-Focused Methods Courses
CI 540 and CI 541 are designed specifically for 6-12 teachers, the others are forK-12 teachers. Choose three or more courses based on diagnostic assessment.

| CI 540 | Modeling with and Using <br> Representations in Mathematics <br> Reasoning and Proving A cross |
| :--- | :--- |
| CI 541 | Mathematics <br> Enhancing Algebraic Thinking: <br> Generalization about Operations |
| CI 513 | Enancing Algebraic Thinking: |
| CI 514 | Patterns and Functions |
| CI 515 | Developing Geometric Thinking <br> and Concepts <br> Exploring Meas urement <br> Concepts |

Advanced Mathematics Methods Course
CI $518 \quad$ Implementing Mathematics Reform
Mathematics LeadershipFocused Courses
Mathematics Leadership: Influencing and Facilitating Improvement
CI 521 Practicum: Mathematics Leadership

If desired, the graduate credit received can be applied toward an M.A., M.S., or Ed.D. in the Department of Curriculum \& Intruction in the Graduate School of Education.
Formore 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 licensure program in early childhood andelementary general and special education that also includes a master's degree. This fulltime program of integrated cours ework and field experiences is completed over sixterms. Students are licensed to teach early childhood and elementary (pre-K to grade 8) and special education. Faculty fromboth curriculumand instruction and special education departments are instructors in this program. This program reflects the rapidly changing nature of America's schools, where a wide range of diverselearners can be found in most classrooms.

## REQUIREMENTS

| Courses |  |  |
| :---: | :---: | :---: |
| SpEd 537 | Reading Assessment \& | 4 |
|  | Instruction (Elementary) |  |
| ITP 535 | Cultivating Responsive | 1 |
|  | Elementary Classrooms |  |
| ITP 509 | Initial Field Experience | 1 |
| Ed 530 | Introduction to Inclusion and | 2 |
|  | Special Education |  |
| ITP 512 | Learning and the Learner | 3 |
| SpEd 509 | Practicum | 1-9 |
| Ed 534 | Literacy Methods for the Inclusive Classroom | 3 |
| SpEd 548 | Positive Behavior Support in the Classroom | 3 |
| ITP 539 | Elementary Mathematics | 1-4 |
|  | Methods |  |
| Ed 535 | ClassroomBased Assessment for the InclusiveEducator | 2 |
| SpEd 532 | Inclusive Practices | 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 |
| ITP 546 or | Student Teaching II | 6* |
| SpEd 536 | Specialized Techniques | 3 |


| Ed 537 | Professional Seminar I: Law and <br> Ethics | 1 |
| :--- | :--- | ---: |
| ITP 547 or | StudentTeaching III | $12^{*}$ |
| 550 | Initial Field Experience | 1 |
| ITP 509 | Diagnostic Assessment | 4 |
| SpEd 512 | Dped 509 | PracticumSpecial Ed |
| SpEd 525 | StudentTeaching <br> Comprehensive Individualized | 6 |
| SpEd 522 | Assessmentand Curriculum 1 <br> Comprehensive Individualized | 3 |
| SpEd 523 | AssessmentandCurriculumII <br> Ed 542 | Collaboration for the Inclusive <br> Elementary Educator |
| Ed 539 | Professional Seminar III: | 2 |
| SpEd 506 | Reflection and Job Search <br> SpecialProblems | 1 |

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 programofintegrated coursework and field experiences is completed over six terms plus one summer. Students als o receive 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 clas sroom.

## REQUIREMENTS

## Courses

| CI 543 |  <br> Materials for Working with <br> Linguistically \& Culturally | 3 |
| :--- | :--- | :--- |
|  | Diverse Stdnts |  |
| Ed 507 | Seminar I: Student Teaching <br> Ed 581 <br> Ed 583 | Inclusive Clas sroomResearcher <br> Study Skills and Learning |
| Ed 585 | Strategies <br> Instructional Planning for | 2 |
|  | Inclusive Clas srooms |  |
| Ed 586 | Collaborative Teaching <br> Ed 587 | Inclusive Educational Research <br> and Leadership |
| ITP 511 | ClassroomManagement for | 2 |
|  | StudentSuccess |  |
| ITP 512 | Learning and the Learner | 2 |


| 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 Instructional Planning | 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: Supervised Field Experience | 3 |
| SpEd 512 | Diagnostic Assessment | 3 |
| SpEd 522 | Comprehensive Individualized AssessmentandCurriculum 1 | 3 |
| SpEd 523 | Comprehensive Individualized AssessmentandCurriculumII | 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.

## ORIENTATION AND MOBILITY SINGLE TRACK CERTIFICATE

The Orientation and Mobility (O\&M) Certificate provides learners with the knowledge and skill competencies recognized by the Academy for Certification of Vision Rehabilitation andEducation Professionals (ACVREP) and the Association for Education and Rehabilitation of the Blind and Visually Impaired (AERBVI) to promote the safe and efficient travel skills of individuals who are blind, visually impaired or deafblind. O\&M Specialists provide individualized as sessment, and instruction to individuals with visual impairment based upon an individual's needs, strengths, preferences and goals within settings that are important to the individual with visual impairment. The O\&M Single Track certificate at PSU is a non-licensure
programofstudy for those who are not working as teachers of the visually impaired but who wish to provide O\&M services in rehabilitation, community, or other educational settings.

## REQUIREMENTS

The following course is recommendedbut not required. It may be taken as an elective for a Master's degree.
SpEd 576 Visually Impaired Learner with 3 Additional Dis abilities

## Courses <br> SpEd 540

Foundations of Education for the Visually Impaired Learner
SpEd 541 Implications of Vision Problems of Children/Youth
SpEd 545 Introduction to Orientation and Mobility and Independent Living Skills
SpEd $549 \quad$ Orientation and Mobility Methods
SpEd $550 \quad$ Orientation and Mobility
Assessmentand Instruction Children
SpEd 551 Orientation and Mobility
Assessment and Instruction Adults
SpEd 552
Orientation and Mobility
Advanced Techniques
12 credits of SpEd 554
Orientation and Mobility
Practicum
Subtotal: 34

## Total Credit Hours: 34

All 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 dependingupon the practicumplacementhours and the availability of a supervising Certified Orientation and Mobility Specialist (COMS). The O\&M Program Coordinator works with students to arrange practicum placements based on geography, student interests, and availability of clinical partners within educational, rehabilitation and community settings. Students are eligible to sit for the national certify ing examfor Orientation and Mobility Specialists within 6 months of completing of cours ework. A pers on may be certified after passing the national exam, submitting documentation of coursework completion, and with a signed documentation from the ProgramCoordinator.

## ORIENTATION AND MOBILITY ADD-ON CERTIFICATE FOR TEACHERS OF THE VISUALLY IMPAIRED

The Orientation and Mobility (O\&M) Certificate provides learners with the knowledge and skill competencies recognized by the Academy forCertification of Vision Rehabilitation andEducation Professionals (ACVREP) and the Association for Education and Rehabilitation of the Blind and Visually Impaired (AERBVI) to promote the safe and efficient travel skills of individuals who are blind, visually impaired ordeafblind. O\&M Specialists provide individualized as sessment, and instruction to individuals with visual impairment based upon an individual's needs, strengths, preferences and goals within settings that are important to the individual with visual impairment. The O\&M Add-On Certificate is an abbreviated programof study that builds upon the foundational knowledge of Teachers of the Visually Impaired and expands the learner's knowledge and skills to provide O\&M services to students with visual impairments.

## REQUIREMENTS

| Courses | OpEd 549 | Orientation and Mobility <br> Methods |
| :---: | :--- | :---: |
| SpEd 550 | Orientation and Mobility <br> Assessment and Instruction - <br> Children | 3 |
| SpEd 551 | Orientation and Mobility <br> Assessment and Instruction - <br> SpEd 552 | Adults <br> Orientation and Mobility |
|  | Advanced Techniques <br> 12 credits of SpEd 554 <br> Orientation and Mobility <br> Practicum | 4 |

Subtotal: 25
All students complete 12 credits of Orientation and Mobility (O\&M) practicumwhich 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 dependingupon the student's work schedule, the available practicumplacement hours 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. Student are eligible to sit for the national certify ing exam for Orientation and Mobility Specialists upon the completion of coursework and the submis sion of the appropriate documentation to ACVREP.

All 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 student's work schedule, the available practicumplacement hours and the availability of a supervising Certified Orientation and Mobility Specialist (COMS). The O\&M Program Coordinator 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 national certify ing exam for Orientation and Mobility Specialists within 6 months of completing coursework. A pers on may be certified after passing the national exam, submitting documentation of coursework completion, and with a signed documentation from the ProgramCoordinator.

## INTERNATIONAL TEACHER EDUCATION PROGRAM

The College of Education offers an International Teacher Education Programforstudents who hold teaching licenses in other countries and who are seeking Oreg on 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 coursework taken at PSU. Candidates willneed to pass a state required performance assessment. 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 13-16 credits of field experience. In addition, the Dual-Language specialization of 18 credit hours is integrated into the programplan of study. Required prerequisite classes should be completed prior to admission into the BTP program. Students may apply at the undergraduate (120 credits/seniorstatus) or graduate level. BTP is a part-time programoffering evening and weekend classes. For more information please see the BTP site at www.pdx.edu/ci/btp.

Please Note: The BTP Programis undergoing revisions during the 2019-2020 Academic Year (thus the multiple $410 / 510$ course numbers).

## REQUIREMENTS

| Early Childhood and Elementary Education |  |
| :--- | :--- | :--- |
| BBE 410- |  |
|  |  |$\quad 4$

Subtotal: 58

* required for licensure but may not be applied toward the M.Ed.

Total 57 credits for M.Ed

Total 70-73 credits for licensure

## READOREGON

The ReadOregon 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 clas sroomteachers.
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 admis sion, vis it http://www.pdx.edu/ci/ReadOregon.

## ESOL ENDORSEMENT

The College of Education offers a programleading to an ESOL endorsement for teachers already holding a valid Oregon teaching license. The program is as follows:

| 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 | AssessmentofLanguage 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 initial/principal and continuing/professional adminis trator licensure of program completers for positions as building and districtlevel administrators. All students are required to have an approved programofstudy, as described below, filed with the College of Education. Admission requirements and detailed programinformation for each programare available from the Department of Educational Leadership and Policy (ELP).

## THE INITIAL/PRINCIPAL ADMINISTRATOR LICENSE (IAL) PROGRAM

This programprepares individuals for positions as building-level adminis trators. 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 orhigher 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 initial/principaladministrator curriculumincludes:
Courses

## Prerequisites:

ELP 506
Special Problems
1-6
Core:
ELP 569
Introductionto Educational
4
ELP 570
Administration
Human Relations and
Educational Foundations
ELP 571

ELP 572
Curriculum
Human Resource Development
ELP 573 Educational Leadership Project I
ELP 574 Education Leadership Project II
III
ELP 509 Administrative Practicum
Subtotal: 32

## THE CONTINUING/PROFESSIONAL ADMINISTRATOR LICENSURE PROGRAM (CAL)

This programprepares individuals for positions as continuing school administrators and as school district administrators. This programrequires prior completion of the initial/principal adminis trator 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 | Education, Community, and Society | 4 |
| ELP 577 | District and School Staff | 4 |
|  | Supervision and Evaluation |  |
| ELP 578 | Communication and Conflict | 4 |
|  | Managementin Educational |  |
|  | Organizations |  |
| ELP 579 | Curriculum, Instruction, and | 4 |
|  | AssessmentLeadership |  |
| ELP 580 | District Policy, Operations, | 4 |
|  | Facilities, and Finance |  |
| ELP 581 | U.S. and Oregon School Law and | 4 |
|  | Policy |  |
| ELP 506 | CAL-Special Problems | 4 |
| Subtotal:28 |  |  |

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 strongerteachers 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 ofliteracy strengths and needs.
- Design targeted, culturally-responsive instruction.
- Plan family literacy outreach and facilitate literacy professional development experiences for colleagues.
- Master the International Literacy A ssociation 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 program is a 25 -credit programincluding a core of 16 credits, 3 credits of practicum, and 6 credits of electives. The program is designed to prepare students for careers as Title Iteachers, reading specialists, literacy coaches, consultants, and district-level reading and language arts coordinators. A reading endorsement is also useful for classroomteachers wishing to develop stronger knowledge about literacy and about teaching students from diverse 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 Specialists | 3 |
| CI 529 | SchoolReading Program Leadership | 3 |
| CI 536 | Language, Literacy, and Culture | 3 |
| CI 574 | Assessing and Teaching Struggling Elementary Readers | 3 |
| Practicum (3 credits) |  |  |
| CI 509 | Practicum: Reading Endorsement | 1-9 |
| Electives (6 credits chosen in cons ultation with advis or) |  |  |
| 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 Workshop | 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 School Counseling specialization has three options: Track I, Track II, and Licensure-only.

## Track I \& Track II

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 (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. 136)") (Track II).

## Licens ure-only

Students enrolled in the licensure-only option must be graduates froman accredited Master's program in counseling, psychology, or social work that required a clinical practicumfocused on individual and group counseling skills. Graduate degrees in teaching or education are notaccepted. 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 Commission 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 Licensureonly) are required to:

- Be fingerprinted and clear Oregon State Police andFBI background checks.
- Complete a school counseling action res earch 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 200 hour 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 ofEducation offers licensure and endorsement programs for:
-
Persons seeking their special 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.
- 

Persons seeking mid-leveland/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 complete a Master of Arts (M.A.) or Master of Science(M.S.) degree in special education.

## Dual endorsement options

The SpecialEducation programoffers a dual endorsement option in elementary education (general education licensure) and special education, referred to as the Inclusive Elementary Educators Program(IEEP). A Secondary Dual EndorsementProgram(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, instructional as sistant, 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 specialneeds.
Learn more about special education programs on our web page for prospective students or attending one of our adv is ing sessions.
PSU offers programs leading to state licensure and endorsements in the following areas:

- Special Educator InitialLicense or Endorsement
- Visually Impaired Learner Intial License or Endorsement
- Early InterventionSpecial Education Intial License or Endorsement


## SPECIAL EDUCATOR INITIAL LICENSE PROGRAM

The SpecialEducator licensure programprepares teachers to work with children and youth with a range ofdis abilities in elementary and secondary settings. The Special Educator licensure program is offered either as a full time (one year) or part time (two year) program.

For current prerequisites pleasesee: http://www.pdx.edu/sped/prerequisites

## REQUIREMENTS

| Courses |  |  |
| :---: | :---: | :---: |
| SpEd 511 | Foundations ofSpecial | 3 |
|  | Education |  |
| SpEd 516 | ClassroomAssessment, Instruction and Behavior |  |
|  | Management(Secondary) |  |
| SpEd 514 | Legal and Ethical Foundations of SpecialEducation | 3 |
| SpEd 509 | Professional Introduction to the | 3 |
|  | Start of the School Year |  |
| SpEd 522 | Comprehensive Individualized | 3 |
|  | AssessmentandCurriculum 1 |  |
| SpEd 537 | Reading Assessment \& |  |
|  | Instruction(Elementary) |  |
| SpEd 548 | Positive Behavior Support in the | 3 |
| SpEd 530 | Families and Advocacy | 3 |
| SpEd 509 | Professional Practices Seminar I | 3 |
| SpEd 523 | Comprehensive Individualized | 3 |
|  | Assessmentand Curriculum II |  |
| SpEd 526 | IEP and Collaborative Teaming | 4 |
| SpEd 512 | Diagnostic Assessment |  |
| SpEd 538 | Reading Assessment and | 4 |
|  | Instruction(Secondary) |  |
| SpEd 533 | Math Assessment and Instruction | 3 |
| SpEd 509 | Professional Practices Seminar II | 3 |
| SpEd 525 | StudentTeaching | 12 |
| SpEd 510 | 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-provisional 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 EthicalFoundations of SpecialEducation |
| SpEd 530 | Families and Advocacy |
| SpEd 537 | Reading Assessment \& Instruction (Elementary) |
| SpEd 509 | Professional Practices Seminar 1 |
| SpEd 548 | Positive Behavior Support in the Classroom |
| SpEd 522 | Comprehensive Individualized AssessmentandCurriculum 1 |
| SpEd 512 | Diagnostic Assessment |
| SpEd 523 | Comprehensive Individualized AssessmentandCurriculum II |
| SpEd 510 | Inclusive Practices |
| SpEd 509 | PracticumII |
| SpEd 526 | IEP and Collaborative Teaming |
| SpEd 516 | ClassroomAssessment, Instruction, and Behavior Management(Secondary) |
| Subtotal: 39 |  |
| VISUALLY IMPAIRED LEARNER INITIAL |  |
| LICENSE | ENDORSEMENT PROGRAM |

The Visually 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 core curriculum and adapt the general education curriculumto insure accessibility 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 |
|  | Community - EL and EI/SE |  |
| SpEd 548 | Positive Behavior Support in the <br>  <br> SpEd 525 | 3 |
|  | Stassroom |  |



Adding a VIL endorsement to a non-provisional teaching license may vary by state and typeofcurrent licenseheld but is approximately 42-50 credits.
Subtotal: 56

3

Impaired Learner with

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 allyoung 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 Care er Development in Childhood Care and Education (OCCD)

The Oregon Center for Career Development in Childhood Care and Education (OCCD) provides leadership in the development and operation of integrated and statewide professional 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

Richard Corsi, Dean
Wu-chiFeng, Associate Dean for Research James Hook, Associate Dean
Jean Cavanaugh, Assistant Dean forFinance \& Administration
Suite 500, Engineering Building
www.pdx.edu/engineering/

- B.S.-Civil Engineering, Computer Engineering, ComputerScience, Electrical Engineering, Environmental Engineering and Mechanical Engineering
- Minor in Computer Science, Electrical Engineering, Environmental Engineering
- 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 and Resources Doctoral Program
- 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 transportation networks. For these reasons, national projections indicate that the need for engineers and computer scientists will continue to increase significantly during the years ahead, with commensurate increases in what are already high wages and opportunities to make substantial positive differences 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, computer science, electrical engineering, and mechanical engineering. Cooperative educational programs with Portland-area industries, government agencies, and engineering consulting offices are available to qualified students.

The degree programs in civil engineering, computer engineering, electrical engineering, environmental engineering and mechanical engineering are accredited by the Engineering Accreditation Commis sion of ABET, 111 Market Place, Suite 1050, Baltimore, MD21202-4012 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 unde rgraduate 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 engineering before they will (1) be allowed to enroll in restricted upperdivis ion courses offered by the programand (2) be graduated from that program. Students apply for formal departmentadmis sion one to two terms before completing all eligibility requirements. Specific department application deadlines, criteria for admission and applications are available on respective department websites.

Students transferring fromother institutions who want to be admitted formally to a specific engineering degree program(civil engineering, computer engineering, computer science, electricalengineering, environmental engineering, mechanical engineering) must:

- Meet all eligibility requirements.
- Apply for admission to PSU.
- Apply for programadmis sion to the Maseeh College of Engineering and Computer Science.
- Have one copy of their transcripts sentto their engineering or computer science department.
- Have one copy of their transcripts sentto the Office of Admissions.

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 des ignee. In addition to the transcript, thestudent requesting the specific course equivalency may be asked to provide catalog descriptions and/or documents certifying course content. To ensure that the student is well prepared for the current curriculum, courseequivalency 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 civil and environmental engineering, computer science, software engineering, electrical and computer engineering, mechanical engineering, engineering \& technology management, materials science and engineering, 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 ofSoftware 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 engineering, 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 Enginee ring and Graduate Certificate

In addition to meeting general University admis sion requirements (p.41), 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 Systems 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 |
| SysE 573 | Requirements Engineering | 4 |
| SysE 591 | Systems Engineering Approach | 4 |

Subtotal: 12

## Take one of the following:

| SySc 514 | SystemDynamics | 4 |
| :--- | :--- | :--- |
| SySc 527 | Discrete SystemSimulation | 4 |

Subtotal: 4

## Integrative Workshop

SysE590 Integrative Workshop 0-4

Subtotal: 4

## Project

You must take nine credits of SysE 506.
Subtotal: 9

## Electives

See department for list of approved electives.

| Total Credit Hours: $\mathbf{4 5}$ |
| :--- |
| Subtotal: $\mathbf{1 6}$ |

The Certificate in Systems Engineering Fundamentals programis currently approved for the ETM department; however, we are not accepting applications at this time.

| Core |  | 4 |
| :--- | :--- | :--- |
| ETM 540 | Operations Research | 4 |
| SysE573 | Requirements Engineering | 4 |
| SysE591 | Systems Engineering Approach | 4 |

Subtotal: 12

## Elective

Choose one of the following:

| SySc 514 | SystemDynamics | 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.- Environmental Engineering
- Minor in EnvironmentalEngineering
- 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 wastewater distribution systems, energy systems, 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 soilmechanics 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 s ources.

## 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 admission 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
Ch 228
Ph 221
Ph 222

Calculus I
Calculus II ..... 4
Calculus IV ..... 4
Applied Ordinary Differential ..... 4Equations

Introduction to Linear Algebra
General Chemistry I
General Chemistry II4
General Chemistry Laboratory ..... 1
General Chemistry Laboratory ..... 1
General Physics (with Calculus) ..... 3I

General Physics (with Calculus)
II

| Ph 223 | General Physics (with Calculus) | 3 |
| :---: | :---: | :---: |
|  | III |  |
| 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 |  |
| EAS 211 | Statics | 4 |
| EAS 212 | Strength ofMaterials | 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.

## ADMISSIONS ELIGIBILITY - BSENVE

To be eligible foradmission to theBSENVE 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 | 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 Phys ics (with Calculus) | 3 |
|  | I |  |
| Ph 222 | General Physics (with Calculus) II | 3 |
| Ph 223 | General Physics (with Calculus) III | 3 |
| 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 |
| 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 2.33.
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 additional details and consideration for special circumstances at ceedept@pdx.edu.
- If not a current PSU student, please apply first to PSU (http://www.pdx.edu/admissions/)


## 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 admission. Students may be admitted ifthey are missing one or more of the following courses:
- CE students: CE 111, CE 112, CE 115, CE 211/CE 212, up to 2 generaleducation courses.
- ENVE students: CE 111, CE 112, CE 115, EAS 212, up to 2 generaleducation courses.
- Earn a C orbetter letter grade in all required/shaded courses on the course plans. Note thatPass/No Pass grades are notaccepted unless 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 Admission GPA will be calculated using only the required/shaded courses indicated on each course plan. If a $\mathrm{P} / \mathrm{NP}$ grade is accepted, it will not be used in the calculation. Repeated classes will be treated with standard PSU repeat/replace policy:
- If a student earned a $D+$ or below in a class the first time, then only the repeated (second) grade will be used in the SelectiveGPA calculation.
- If a student earned 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 SelectiveGPA 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 admission will be prioritized by the Selective admission GPA with the total number admitted based on available class and lab capacity.
- Students with low Selective Admis sion GPAs may be offered or required to complete the CEEUpper Divis ion Preparation course. If required, successful completion of the Summer Bridge may result in admission to the Upper Division program.
- Admission decisions will be communicated to the student by email. Decis ions will be:
- Admit
- Admit, Recommend CEE Upper Division Preparation Course
- Defer, Require CEE Upper Division Preparation Course
- Defer, W ait 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 admission to the Upper Div is ion Program, students will be expected to make satisfactory progress toward their declared degree (BSCE or BSENVE).

Satis factory 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 totalof 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 session with the Department Chair or des ignee. If readmitted, the suspended student will be given clear continuation criteria that may exceed the pre-suspension satis factory progress (continuation criteria) listed above. Failure to meet the revis ed continuation criteria following the first suspension will result in permanent suspension from the academic program.

## Appe als

Students may appeal department admission decisions or department continuation criteria decisions by submitting a petition to the Department Chair. The Chair's decisioncan be appealed to an ad-hoc departmental appeal's committee cons isting 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 and elective courses in structural analysis and design, environmental engineering, water res ources, transportation engineering or geotechnical engineering.

Students may elect to focus coursework in a specialty area in their senior year through electives. The program culminates with a finalcapstone design course that allows students to apply many of the principles and concepts on a community-serving project.
The BSCE programis accredited by Engineering Accreditation Commiss ion of ABET, 415 North Charles Street, Baltimore, MD 21201, a national organization that sets standards for eng ineering education defined in terms of curricular content, quality of faculty, and adequacy of facilities of engineering programs.

## BSCE Program Educational Objectives

The civil engineering programat Portland StateUniversity prepares graduates to practice civil engineering responsibly 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 civil engineering 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 thatmeet 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, establish 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. 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 BSCE program;
5. Any deviation from the required courses including engineering and mathematics substitutions must be approved in writing by the Department Chair. Transfer students should follow the information found on the MCECS Transfer
Page:https://www.pdx.edu/cecs/transferring-credits

| Freshman Year |  |  |
| :--- | :--- | ---: |
| CE 111 | Introductionto Civiland | 3 |
|  | Environmental Engineering |  |
| CE 112 | Civil and Environmental <br> Engineering Computations | 3 |
| CE 115 | Civil Engineering Drawing and | 3 |
|  | 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 | Calculus II | 4 |
| Mth 261 | Introductionto Linear Algebra | 4 |
|  | Freshman Inquiry | 15 |

Subtotal: 46

| Sophomore Year |  |
| :---: | :---: |
| EAS 211 | Statics |
| EAS 212 | Strength ofMaterials |
| EAS 215 | Dynamics |
| CE 211 | Plane Surveying and Mapping |
| CE 212 | Field Problems in Plane |
|  | Surveying |
| Mth 254 | Calculus IV |
| Mth 256 | Applied Ordinary Differential |
|  | Equations |
| Ph 221 | General Physics (with Calculus) |
|  | I |
| Ph 222 | General Physics (with Calculus) |
|  | II |
| Ph 223 | General Physics (with Calculus) |
|  | III |
| Ph 214 | Lab for Ph 201 or Ph 211 or Ph |
|  | 221 orPh 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 or Ph 233 |
|  | Sophomore Inquiry |4

Junior Year Engineering Profession
CE 321 CEE Properties of Materials
CE 361 Fluid Mechanics 4
CE 324 Elementary Structural Analysis 4
CE 325 Indeterminate Structures 4
CE 341 Soil Classification and Properties 4
CE 351 Introduction to Transportation 4
CE $362 \quad$ Engineering Hydraulics 4
CE 364 Water Resources Engineering 4
CE 371 Environmental Engineering 4
G 301 Geology for Engineers 3

Stat 451

Ec 314U

Applied Statistics for Engineers and Scientists I
Private and Public Investment
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 |
| CE 484 | Civil \& Environmental |
|  | Engineering Project Management and Design I |
| CE 494 | Civil \& Environmental |
|  | Engineering Project Management and Design II |
|  | One Structural Design Elective |
|  | One Transportation Design |
|  | Elective |
|  | Approved civilengineering electives |
|  | Upper-divis ion cluster |

Subtotal: 45

| Approved | Structural Design Elective: |
| :---: | :---: |
| CE 432 | Structural Steel Design |
| CE 434 | Principles of Reinforced |
|  | Concrete |

Approved Transportation Design Elective:
CE 450 Transportation Safety Analysis
CE 458 Public Transportation Systems
CE 459 Transportation Operations
CE 462 Traffic Engineering Applications
CE 493 Design and Operation of Bicycle and Pedestrian Infras tructure

## Approved Civil Engineering Electives:

| CE 401 | Research | $1-6$ |
| :--- | :--- | :--- |
| CE 403 | Honors Thesis | $1-4$ |

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; additionalcredits require Department Chair approval.
CE 407: 3 credits recommended maximum; additional credits require Department Chair approval.
Subtotal: 187
Students may take one course outside the CEE Department to apply toward senior electives. Approved non-CE
courses are ME321 (p. 933), ME455 (p. 937), G 424 (p. 824), Geog 488 (p. 843), and Geog 492 (p. 843). Additional non-CEclasses 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 natural environment - an especially important part ofour culture in Portland and in the state of Oregon. Oregon prides itselfon its environmental commitments and efforts toward living sustainably. This degree focuses on the fundamentals of environmental and water resources engineering with required and elective courses in geoenvironmental, surface water hydrology, surface and groundwater water quality, groundwater hydrology, and air quality. The programincludes foundational and fundamental courses in chemistry, mathematics and statistics, physics, geology and biology. The program culminates with a finalcapstone design 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 Program Educational Objectives

The environmental engineering programprepares graduates to practice environmental engineering responsibly and ethically by (1) working effectively in the professional engineering community and (2) continuing to learn and enhance their abilities in environmental engineering.

## BSENVE Student Outcomes

Graduates of the environmental engineering programwill 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 thatmeet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, andeconomic 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 provideleadership, create a collaborative and inclusive environment, establish 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 (p.31) and department degreerequirements 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 314 U 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.

Transfer students should follow the information found on the MCECS Transfer
Site: https://www.pdx.edu/cecs/transferring-credits

| Freshman Year |  |  |
| :--- | :--- | ---: |
| CE 111 | Introductionto Civiland <br> Environmental Engineering | 3 |
| CE 112 | Civil and Environmental <br> Engineering Computations | 3 |
| CE 115 | Civil Engineering Drawing and | 3 |
|  | 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 | Calculus II | 4 |
| Bi 234 | Elementary Microbiology | 4 |
| Bi 235 | Microbiology Laboratory | 2 |
|  | Freshman Inquiry | 15 |

Subtotal: 48


Junior Year
ME 321 Engineering Thermodynamics I 4
CE 315 The Civil and Environmental 1
$\begin{array}{ll} & \text { Engineering Profession } \\ \text { CE } 345 & \text { Environmental Soil Mechanics }\end{array}$
CE 361 Fluid Mechanics 4
CE 362 Engineering Hydraulics 4
CE 364 Water Resources Engineering 4
CE 371 Environmental Engineering 4
CE $412 \quad$ Sustainability in Civil \& $\quad 1$
EnvironmentalEngineering
Seminar
EnvE $365 \quad$ PhysicalEnvironmental 2
Processes
EnvE 366 Analytical Methods in 2
Environmental Engineering
EnvE 368 Physical Environmental Process 2
Lab
EnvE 369 Analytical Methods in
2
Environmental Engineering Lab
Sampling, Analys is and Risk
Assessment for Environmental Engineering Lab
G301 Geology for Engineers 3
Stat 451 Applied Statistics for Engineers 4
and Scientists I
Subtotal: 45
Senior Year
CE 474
Unit Operations of
4
Environmental Engineering
CE $480 \quad$ Chemistry of Environmental
4

| CE 484 | Civil \& Environmental | 3 |
| :---: | :---: | :---: |
|  | Engineering Project |  |
|  | Management and DesignI |  |
| CE 494 | Civil \& Environmental | 3 |
|  | Engineering Project |  |
|  | Managementand Design II |  |
| Ec 314U | Private and Public Investment | 4 |
|  | Analysis |  |
|  | Upper-division cluster | 8 |
|  | Approved Environmental | 24 |
|  | Engineering Electives |  |

Subtotal: 46
Ec 314 U is a required course that canbe taken as a part of some upper-division clusters.

Electives: see below.

## Approved Environmental Engineering Electives:

There are approved electives in geo-environmental engineering, surface water quality, surface hydrology and hydraulics, subsurface hydrology and contaminant transport, and air quality. 24 credits of technical electives are required to complete theBSENVE 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 | Coopative |  |

CE 404 Cooperative 1-12
CE 405 Education/Internship $\quad 1-6$
CE 406 Special Projects 1-6
CE 407 Seminar 1-6
CE 410 Selected Topics 0-6
CE 445 Geo-environmental Engineering 2
with Geosynthetics
CE Fate and Transport ofToxics in 4

479/ESM the Environment
479
CE $480 \quad$ Chemistry ofEnvironmental 4
CE 481 The Columbia River as a System 2
CE 482 Introduction to Sediment 4
CE 483 Estuarine Circulation 4
CE 469 Subsurface Hydrology 4
CE 485 EnvironmentalCleanupand 4
CE 486/Ch EnvironmentalChemistry 4
486
CE 487/Ch
487
CE Air Quality
488/ESM
460
CE 489
Introduction to Advanced
EnvironmentalFluid Mechanics

| CE 490 | Soil and Groundwater <br> Restoration | 4 |
| :--- | :--- | :--- |
| CE | Watershed Hydrology | 4 |
| $565 /$ ESM |  |  |
| 525 | Environmental Data Analysis | 4 |
| CE |  |  |
| $566 /$ ESM |  | 4 |
| 566 | Advanced Methods in |  |
| CE 568 | Hydrologic SystemAnalysis | 4 |
| CE 571/CE | Subsurface Contaminant <br> 671 | Transport |
| CE 572 | EnvironmentalFluid Mechanical | 4 |
| CE 573 | Transport <br> Numerical Methods in <br> Environmentaland Water | 4 |
| CE 576 | Resources Engineering <br> 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. 1057), Ph 471, Ph 477, G 424 (p. 824), Geog 488 (p. 843), or Geog 492 (p. 843). 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: 187

## ENVIRONMENTAL ENGINEERING MINOR

4

## Preparatory Prerequisite Cours es

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.

| 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 |
| Mth 252 | Calculus II |
| Mth 261 | Introduction to Linear Algebra |
| EAS 211 | Statics |

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 | Calculus IV | 4 |
| :---: | :---: | :---: |
| Mth 256 | Applied Ordinary Differential | 4 |
|  | Equations |  |
| Ph 221 | General Physics (with Calculus) I | 3 |
| 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 for Ph 202 or Ph 212 or Ph | 1 |
|  | 222 orPh 232 |  |
| Ph 216 | Lab for Ph 203 or Ph 213 or Ph | 1 |
|  | 223 orPh 233 |  |
| Ch 221 | General Chemistry I | 4 |
| Ch 222 | General Chemistry II | 4 |
| Ch 227 | General Chemistry Laboratory | 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 approved electives. 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 admission 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 cannotminor 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 the chance to develop undergraduate degree programs that reflect their particular interests - many of thesestudents go on to graduate school. W orking closely with a CEE faculty
advis or, 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 admis sion 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 with in 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 proposal for 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 +
- 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 substituteHON 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 satis fied. Students must start their master's programwithin one academic year of BSCE/BSENVE graduation in order to use their pathway courses towards their master's degree. Students not meeting the continuation criteria can still apply for admission to the master's degree program without 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 graduaterates 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 residenceat 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 cours ework 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 upper division BSCE/BSENVE coursework, excluding university studies upper division clus ter courses.
- InstitutionalGPA of 3.30 at time of eligibility notification.
Eligible students mustres pond 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 through to completion ofBSCE/BSENVE degree
- Enroll in CEE Master's graduate program within 1 year of graduation from BSCE/BSENVE


## Graduate programs - Civil and Environmental Engineering

## ADMISSION REQUIREMENTS

## MS and MEng

Admission 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 prerequisites for the graduate courses that comprise the student's programofstudy. Applicants without these qualifications may be considered for conditional admission. To be considered for admission 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

Admission 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 advisor. For admis sion, a student must have a CEE faculty member agree to be his/her PhD advisor. Applicants must also meet PSU graduate admis sion requirements. Please refer to Graduate Studies for these requirements. Application ins tructions for the PhD programare available at pdx.edu/cee/graduate-admissions.

## CIVIL AND ENVIRONMENTAL ENGINEERING MS

The Master of Science in Civil and Environmental Engineering program is 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 analysis and design, transportation engineering, water resources, environmental engineering, and geotechnical engineering, as well as science and mathematics. Flexibility is achieved by des igning 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 fulldetails.

## Application Deadlines - MS

- Fall - January 1 (for strongestconsideration for funding as a Graduate Research or Teaching Assistant)
- Winter-September 1
- Spring - November 1


## Degree Require ments - MS

MS students are required to complete tentative degree plans after completing 18 credits. The degree plan must be approved by their advis or. 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 ofCE 501 Research, CE 504 Internship, CE 505 Reading and Conference, orCE 506 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, CE 505 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 thestudent.
Studentresearch 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 " $\mathrm{C}+$ " 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 Departmentof 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 mustbe 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 byPSU's GraduateSchool. Please refer to the Graduate School for information concerning advanced degree requirements, degree status, petition processes, thesis preparation, and final oral exam.

## CIVIL AND ENVIRONMENTAL

 ENGINEERING MENGThe 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 advis or. 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 approval may not be accepted as part of the student's program. Students must also meet the Univers ity master's degree requirements.

## Application Deadlines - MEng

- Fall - January 1
- Winter-September 1
- Spring - November 1


## Degree Require ments - MEng

A total of 48 graduate credits are required for the MEng program. Coursework may include up to 8 hours of CE 501 Research, CE 504 Internship, CE 505 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 thestudent.

CEE courses for which the studentreceives 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 DepartmentofCivil 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 the consent of the student's adviser. Non-degree seeking students may take Civil and Environmental Engineering courses pass/no pass with the consentof the instructor.

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 studentmust 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 theCEE website (www.pdx.edu/cee). Allother degree requirements for the 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 EnvironmentalEngineering program offers advanced courses in the areas ofstructural analysis 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 res earch topic.

## Application De adlines - PhD

- Fall - January 1 (for strongestconsideration 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 programofstudy, which includes a minimum of 24 hours coursework. Coursework may include up to 8 hours ofCE 601 Research, CE604 Internship, CE605 Reading and Conference, orCE 606 Projects;
3. Meet the University's res idency requirement;
4. Pass the comprehensive examination;
5. Present and pass a proposal defense for advancement to candidacy;
6. Complete 27 credit hours ofdissertation credit (CE 603) leading to the completion of a doctoral dissertation;
7. Present and pass the finaloral dissertation defense; and
8. Submit the written dissertation in compliance with University guidelines and deadlines.

Internship credits (CE 604) require a project and final report; thesecredits 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 $\mathrm{C}+, \mathrm{C}$, orC- 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 ofCivil 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 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 hydrology, and leads to
professional certification with the American Institute of Hydrology (AIH). Requirements for the certificate are listed within the Environmental Science and Management section (p.253).

## 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 programor concurrently enrolled in masters and doctoral programs at PSU. The certificate is administered by the Economics department (p.383). 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 analytical knowledge of those who are in or wish to enter the transportation field. This program could 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. Admission 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.412).

## Computer Science

120 Fourth Avenue Building 503-725-4036
www.pdx.edu/computer-science/

- B.S.-Computer Science
- Minor in Computer Science
- M.S.-Computer Science
- Ph.D.-Computer Science
- Graduate Certificate in ComputerSecurity

The Department of Computer Scienceoffers 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. Our faculty members specialize in a variety of research areas such as artificial intelligence \& machine learning; computer science education; computer security \& privacy; computer vis ion \& computer graphics; data science; natural language processing; programming languages \& formal methods; software engineering; systems \& networking; and theory.

## Undergraduate program

The undergraduate computer science programis designed to provide students with the educational background required for a professional career in the computing industry and for furtherstudy 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-termcapstone 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 organization 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 Computer Science'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 ofethical 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 file the Application to the Computer ScienceProgramwith the Department of Computer Science after completing the lower-division requirements. Students with questions should contact the Computer ScienceDepartment. No more than 8 upper-divis ion computer science credits (including any approvedupper-division transfer credits) taken prior to admission to the program will be counted toward the student's departmental requirement of 52 upper-division computer science credits (CS 300, CS 305, CS 320, CS 333, CS 350, CS 486, CS 469, CS 470 and 24 credits of upper-division computer scienceelectives). Students als o must be in admitted status during the term they intend to graduate.

## CS Admission Requirements

Applies to students pursuing a B.S. in Computer Science wishing to enroll in
Upper-div is ion CS courses for Fall 2021 and Winter 2022
Computer Science Dept. website: www.pdx.edu/computerscience

## Terms of Admission \& Deadlines

- Fall and winter terms of admission only. Falladmission is preferred.
- The Application deadline for fall is April 15, for winter September 1.
- The Application for Undergraduate Admis sion is available at https://go.cecs.pdx.edu/CS-ug-application
- A detailed four-year course plan is included in the "ComputerScience Blue Sheet", also available from the above website.


## Minimum Eligibility for Consideration

1. Completion of each of the follow ing core CS courses with a C or better by the application deadline and an All Attempts CS GPA of at least 2.0.

- CS 162 Intro to Computer Science (4)
- CS 163 Data Structures (4)
- CS 202 Programming Systems (4)
- CS 250 Discrete Structures I (4)


## All Attempts CS GPA

- The grades fromall attempts at CS 162, CS 163, CS 202 and CS 250 are included in the cumulative grade point calculation used for admission purposes (All Attempts CS GPA). Grades of P, X, and the first W in a course are not included in the All Attempts CS GPA Computation. The second and subsequent grades of W for a course are counted as F's.

2. Completion of each of the following Non-CS courses with a grade of C - or better by the application deadline.

- MTH251
- MTH252
- First two terms of an Approved 3-termLab Science Sequence
While not required for admis sion, students are strongly encouraged to complete the third termof their Approved 3term Lab Science Sequence and MTH 253 or MTH 261 before taking upper division Computer Science courses. These classes are graduation requirements.

3. Completion of Fres hm an Inquiry with grades of C-or better, or for students transferring 30 or more credits to PSU, WR 121 and COMM 220 with grades of C- or better by the application deadline.

## 4. Successful completion of the CS Transfer Programming Proficiency Demo.

- As part of their application to the CS program, all students must satis factorily complete a programming proficiency demonstration. See Computer Science Dept. website for more information. Students who have not yet completed CS 202 with a C or better at PSU will be sent a link to sign up for the proficiency demo upon submis sion and review of their CS application during the appropriate deadline.


## Competitive Admission

- Capacity is limited. Admissions are competitive, based on students' All Attempts CS GPA. Refer to Student Statistics on the Computer Science Department's website for information on the GPA required for admission by recent cohorts.
- A student's All Attempts CS GPA will be computed based on grades recorded in the PSU transcriptsystem by the application deadline. Students transferring courses toPSU from other institutions are responsible for ensuring their grades are transferred to PSU prior to the admission decision deadline (approximately three
weeks after the application deadline). Students whose grades are transferred after the decision deadline will be considered for any remaining openings. Grades of courses completed after the application deadline will not be considered.


## Appeals

- Students denied admis sion to the CS programmay submit a written appeal using the officialCS Appeals Form to the CS Appeals Committee. All decisions are final.


## Priority Registration

- Most applicants will have completed 90 credits by the time they apply. This gives themregistration priority over students that have completed less than 90 credits. Applicants with less than 90 credits may find classes are full by the time they are able to register. The ComputerScience Department is unable to provide overrides to allow earlier registration.


## Additional testing/bridge classes

- Proficiency testing is required of students who did not complete and pass CS 202 at PSU.
- No bridge class required.


## Pass/No Pass

- All required classes mustbe taken for a grade (not $\mathrm{P} / \mathrm{NP}$ ) unless they are only offered as P/NP.
- No GPA penalty for a Pass orNo Pass (but the student may be required to retake the class for a letter grade).


## Additional Information (exceptions, preferences, etc.)

- No preference is given toPSU students versus students who completed required courses els ewhere.


## 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 admission. Acceptable progress is defined as completion of at least eight credits of
coursework with acceptable grades (Cor better for required CS courses, C - orbetter for required non-CS courses), satisfying departmental requirements, over the preceding academic year. Readmission willbe determined by theCS UndergraduateCommittee.


## Prerequisite Policy

- In order to enroll in any upper division or graduate Computer Science course, students must beadmitted to the Computer Science programor have the instructor's permission. Before enrolling in any Computer Science 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 administratively dropped from the course.


## Laptop Requirement

- Beginning in fall 2021, students registering for upper division (300-or above) Computer Sciencecourses, must have access to a laptop with wireless 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 notmeet the requirements torun many applications that may be used in various CS courses.


## Department Communication

- Fall 2021 and winter 2022 admis sion requirements are available the preceding academic year's spring term (spring 2021).


## 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 C or better. Courses taken outside the department as part of departmental requirements must be gradedC- or better. If a course is offered only on a Pas s/NoPass ( $\mathrm{P} / \mathrm{NP}$ ) 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. After admission 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 completeall University Studies requirements, including freshmanand 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. Trans fer students should consult with the CS departmental adv iser 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 162 | Introduction to Computer |  |
|  | Science |  |
| CS 163 | Data Structures | 4 |
| CS 202 | Programming Systems | 4 |
| Mth 251 | Calculus I | 4 |
| Mth 252 | Calculus II | 4 |
|  |  | 4 |
| Mth 253 | Calculus III |  |
|  | or |  |
| Mth 261 | Introductionto Linear Algebra |  |
|  |  | 4 |
|  | Freshman Inquiry |  |
|  | Free electives |  |
|  |  |  |
| Sophomore year | 4 |  |
| CS 201 | Computer Systems Programming | 4 |
| CS 250 | Discrete Structures I | 4 |
| CS 251 | Discrete Structures II | 4 |
|  | ApprovedLaboratory Science | 4 |
|  | Sophomore Inquiry | 4 |

Subtotal:39

| Junior year <br> CS 300 | Elements of Software | 4 |
| :--- | :--- | :---: |
| CS 305 | Engineering <br> Social, Ethical, and Legal <br> Implications of Computing | 2 |
| CS 320 | Principles of Programming | 4 |
| CS 333 | Languages <br> Introduction to Operating | 4 |
| CS 350 | Systems <br> Algorithms and Complexity | 4 |


| CS 486 | Introductionto Database | 4 |
| :---: | :---: | :---: |
|  | Management Systems |  |
|  | Approved upper-division | 4 |
|  | programming intensiveCS elective |  |
|  | Free electives | 4 |
| Wr 227 | Introductory Technical Writing | 4 |
|  | Upper-division cluster | 12 |
| Subtotal: 46 |  |  |
| Senior year |  |  |
| CS 469 | Software Engineering Capstone I | 3 |
| CS 470 | Software Engineering Capstone | 3 |
|  | II |  |
| ECE 341 | Introductionto Computer | 4 |
|  | Hardware |  |
|  | Approved upper-division | 20 |
|  | computerscienceelectives |  |
|  | Approved Math electives | 7 |
|  | Approved Science elective | 4 |
|  | Free electives | 3 |

Subtotal: 44
Note: The Univers ity requires all students to have a minimum of 72 upper-division credits to graduate. Since fewer than 72 upper-divis ion 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 Scienceelectives
The total may include any regular 300- and 400-level
computer science course, and any of the cours es:
ECE 455 AI: Neural Networks I 4
ECE 456 AI: Neural Networks II 4
ECE 485 MicroprocessorSystemDesign 4
ECE 486 Computer Architecture 4
Stat 451 Applied Statistics for Engineers 4 and Scientists I
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 Special Projects 1-6
CS 407 Seminar 1-6
CS 409 Practicum 1-9
At least 4 credits of approved "Programming Intensive" courses must be taken. These courses can be identified by the "P" suffix in the course number (e.g., CS 410P, CS 465P, CS 494P, etc.). Additionally, CS 404, Univers ity Studies courses, and courses specifically described as not being applicable to the CS degreemay 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 |
|  | I |  |
| Ph 212 | General Phys ics (with Calculus) | 4 |
|  | II |  |
| Ph 213 | General Physics (with Calculus) | 4 |
|  | III |  |
|  | 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 |  |
| Sequence 2: |  |  |
| Ch 221 | General Chemistry I | 4 |
| Ch 222 | General Chemistry II | 4 |
| Ch 223 | General Chemistry III | 4 |
|  | With |  |
| Ch 227 | General Chemistry Laboratory | 1 |
| Ch 228 | General Chemistry Laboratory | 1 |
| Ch 229 | General Chemistry Laboratory | 1 |
| Sequence 3: |  |  |
| Bi 211 | Principles of Biology: Molecular | 4 |
| Bi 212 | Principles of Biology: | 4 |
|  | Development, Evolution \& |  |
|  | Ecology |  |
| Bi 213 | Principles of Biology: | 4 |
|  | Organisms, Biodiversity \& |  |
|  | Conservation |  |
| Bi 214 | Principles of Biology Lab I | 1 |
| Bi 215 | Principles of Biology Lab II | 1 |
| Bi 216 | Principles of Biology Lab III | 1 |
| Approved Scienceelectives |  |  |
| Students must complete additional credits of Approved 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. |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
| Approved Mathematics electives |  |  |
| Students must complete 7 or more credits of approved mathematics electives. The current list of approved courses includes: |  |  |
|  |  |  |
| Mth 261 | Introductionto Linear Algebra | 4 |
| Mth 311 | Introductionto Mathematical | 4 |
|  | Analysis I |  |
| Mth 343 | Applied Linear Algebra | 4 |

Mth 344 Introduction to Group Theory 4
and Applications
Mth 346 Number Theory 4
Mth 356 Discrete Mathematics 4
Mth 457 The MathematicalTheory of 3 Games I
Mth 458 The MathematicalTheory of 3
Games II
Mth $461 \quad$ Graph Theory I 3
Mth 462 Graph Theory II 3
Stat 366 Introductionto Experimental 4
Stat 451 Applied Statistics for Engineers 4
and Scientists I
Applied Statistics for Engineers 3
and Scientists II
Applied Regression Analysis 3
Applied Probability I 3
Applied Probability II 3
Other upper-division mathematics orstatistics courses may be used to satisfy the requirement with prior written approval from the Computer Science Undergraduate Adviser.

COMPUTER SCIENCE MINOR
A minor in computer science is available within the Maseeh College of Engineering and Computer Science in the area of computerscience.

## REQUIREMENTS

To earn a minor in computer science, a student must complete 24 credits as follows:

## Courses

CS 162

CS 163
CS 201
CS 202
Introduction to Computer
Science
Data Structures
Computer Systems Programming 4
Programming Systems 4
Approved CS Minor courses 8

Only grades of C or better count toward departmental requirements. At least 12 of the required 24 credits must be taken at Portland State University.
Approved CS Minor courses include any lower-division or upper-division Computer Science course. Permis sion to reg ister for upper-division CS courses requires successful completion of the Programming Proficiency
Demonstration.
Subtotal: 24
COMPUTER SCIENCE - HONORS TRACK

The honors degree in computer science requires the writing of an honors thesis. Details about the programcan be found on thecomputer science website at https://www.pdx.edu/computer-science/honors-track.

## BIOMEDICAL INFORMATICS PROGRAM

Portland State University and Oregon Health \& Science Univers ity offer an accelerated, collaborative degree programin biomedicalinformatics. Designed for high 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 aboutthe programcan be found on the computer science website at https://www.pdx.edu/computer-science/biomedical-informatics.

## Graduate Programs

## ADMISSIONS REQUIREMENTS

To be considered foradmis sion to the graduate programin computer science, the student musthave 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 background needed for graduate study before applying for admis sion. The Grad Prep programdescribed at https://www.pdx.edu/computer-science/grad-prep may be helpful in 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 that the department has waived its requirement forthe Graduate Record Examination (GRE) through fall 2022. Applicants should also submit two letters of recommendation, 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 program in computerscience is designed to prepare students for advanced careers in the computer industry, to create a research environment in computer science, and to prepare students forgraduate work at the Ph.D. level.
See University Master's degreerequirements (p.51). The Master's program in computer science consists oftwo 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, coursework is to include core courses in theory and programming practice, plus a 9 -credit concentration in one of the areas listedon the computerscience departmental web site. For the thesis option, successful completion of a final oral examination covering the thesis is required.

## THEORY REQUIREMENT

## One theory course from:

CS 581 Theory of Computation 3
CS 584 AlgorithmDesign and Analysis 3
CS 578 Programming Language 3
Semantics
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 -levelcoursenumber. Subtotal: 3

## ELECTIVES

Students must take enough electives to complete 45 total credits for the Master's degree. Electives can be any 500levelCS course (CS 501, CS 502, CS 504, and CS 509 credits 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 CS Graduate Advisor approval. Students may use credits froma combination of these three categories, but if the total exceeds the 15 credit limit, then the excess will not be counted towards the degree.

- Pre-admission credits (taken beforethe termofformal admission) 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.
- Transfer credits refer to credits taken fromanother institution other than PSU. To request approval of transfer credits, 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 necessary. 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.
- Non-CS credits taken outside of Computer Science, such as ECE or Math, can count towards elective requirements once approved. Students should obtain advis or approval in advance to avoid the risk of taking a course that will not be approved. To request approval, submit a plan of study with the courses listed to the Graduate Advisor. Non-CS courses must be graduate level. Note that only one ETM course will count towards the elective requirements. AllETM 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 management systems. Other topics that have been offered in the track include formal foundations of databases, databases for cloud and cluster environments, and data stream systems.

$$
\begin{array}{ll}
\text { CS } 586 & \text { Introduction to Database } \\
& \text { ManagementSystems }
\end{array}
$$

And two courses from the following*:

| CS 587 | Database Management Systems <br> Implementation |
| :--- | :--- |
| CS 558 | Programming Languages |

*Or any approved CS 510 course in Databases.

## Artificial Intelligence andMachine Learning

Covers modern algorithms underlying intelligent and learning systems. Examples of topics covered in courses on this track include knowledge representation, planning, reasoning, combinatorial and adversarial search methods, natural language processing, computer vis ion, statistical machine learning, and evolutionary and reinforcement learning.
CS 541 Artificial Intelligence
CS 545
Machine Learning

One course from the following*:

| CS 542 | Advanced Artificial Intelligence: <br> Combinatorial Games <br> Advanced Artificial Intelligence: <br> CS 543 |
| :--- | :--- |
| CS 546 | Advanced Topics in Machine |
| CS 570 | Learning <br> Machine Learning Seminar |
| Stat 671 | Statistical Learning I <br> Stat 672 |
| Statistical Learning II |  |

Stat $671 \quad$ Statistical Learning I 3
Stat 672 Statistical Learning II 3

Stat 673 Statistical Learning III 3
*Or any approved CS 510 course in Artificial Intelligence or Machine Learning.

## Languages and 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
3
CS $520 \quad$ Object-Oriented Programming \& 3 Design
$\begin{array}{lll}\text { CS 553 } & \text { Design Patterns } & 3 \\ \text { CS } 557 & \text { Functional Programming } & 3 \\ \text { CS } 578 & \text { Progran }\end{array}$
CS 578 Programming Language 3 Semantics
*Or any approved CS 510 coursein 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 | 3 |
| :--- | :--- | :--- |
|  | 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 |  |

* Or any approved CS 510 course in Security.


## Software Engineering

Studies the principles, processes, techniques, and tools for building software systems. Topics include software requirement, design, development, validation, and maintenance.
CS $554 \quad$ Software Engineering

Two courses fromthe following*:

| CS 552 | Building Software Systems with <br> Components | 3 |
| :--- | :--- | ---: |
| CS 553 | Design Patterns <br> CS 555 | Software Specification and |
| CS 556 | Verification | 3 |
|  | Software Implementation and <br> Testing | 3 |
| CS 561 | Open Source Software | 3 |
|  | DevelopmentLaboratory | 3 |
|  |  |  |

*Or any approvedCS 510 course in Software Engineering.

## Systems andNetworking

Studies the design and implementation ofoperating systems, wired and wireless computer networks including high performance computer systems, data centers, cloud computing architectures, distributed systems, fault tolerance, concurrency, systems programming, and theoretical topics related to these areas.
CS 533 Concepts of Operating Systems 3
CS 594 Internetworking Protocols

One course from the following*:
CS $515 \quad$ Parallel Programming 3
CS 538 Computer Architecture 3
CS 572 Operating SystemInternals 3
CS 598 Introductionto Wireless Network 3 Protocols
*Or any approved CS 510 course in Systems and Networking.
Subtotal: 9
Total Credit Hours: 45

## Application for Graduation

You must apply for graduation no later than the first Friday of the termyou wish to graduate.

The application for graduation can be found at:
http://www.pdx.edu/ogs/forms

## Cumulative Graduate GPA

You 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

You must have a GPA of 3.0 or above in all courses being used to meet your degree requirements. The number of credits beingused to meet your degree requirements appears below along with the GPA for those courses. You must have the minimumnumber of credits needed for your degree beforeyou can graduate.

## COMPUTER SCIENCE PH.D.

The doctoral degree programin computer science is designed to prepare students for advanced research or university teaching in the field.
See University doctoral degree requirements (p. 54). The student must complete an approved programof 90 graduate credits, including 18 credits of core courses and 27 credits of dissertation research. To be admitted to Ph.D. candidacy, a student must pass the Research Proficiency Examination (RPE) and must present an acceptable dis sertation proposal. The dis sertation comprises original research work, which is expected to be of a quality meriting publication in a refereed journal or conference.

## CYBERSECURITY GRADUATE CERTIFICATE

The cybersecurity certificate programrequires admis sion as a graduate student, similar to admis sion to the Master's program, in the Computer Science department. The programrequires 21 hours total of graduateclasses. There are three core classes for a totalof 6 hours. In addition four optional classes must be taken for the needed additional 15 credit hours. In summary, seven graduate classes must be taken, two are core, and fives classes are electives.

| Required Core Courses |  |  |
| :---: | :---: | :---: |
| CS 591 | Introductionto 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 Verification | 3 |
| CS 556 | Software Implementation and | 3 |
|  | Testing |  |
| CS 576 | Computer Security Research | 3 |
|  | Seminar |  |
| 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 successful engineering 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 res earch. This means ourgraduates 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 engineering. 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 departmental honors track as described below.

The electrical engineering and computer engineering programs at Portland State University are accredited by the Engineering Accreditation Commis sion of ABET, 111
Market Place, Suite 1050, Baltimore, MD 21202-4012 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

For students 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 program is 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 thatstudents 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 upper division math, science, computer science, and engineering courses that are required forone 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 forour undergraduate degree programs.
- If a studentretakes 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 orhigher 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 ofstudents. Students with transfer credits are treated the same as students who complete their courses at PSU.


## ELIGIBILITY

To be eligible for admis sion, each student should meet the following minimum requirements:

1. Complete, with a minimum grade of $C$ and a minimum GPA of 2.25 , a designatedset of courses for each program as follows:
Electrical 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 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
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
Ph 221 General Physics (with Calculus) 3
Ph 222 General Physics (with Calculus) 3
II
Ph 223 General Physics (with Calculus) 3 III
Ph $214 \quad$ 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 1
222 or Ph 232
Ph $216 \quad \mathrm{Lab}$ for Ph 203 or Ph 213 or $\mathrm{Ph} \quad 1$
223 or Ph 233
Freshman Inquiry
$\mathrm{Ph} 211, \mathrm{Ph} 212$, 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 1
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
Mth $251 \quad$ Calculus I 4
Mth 252 Calculus II 4
Mth 253 Calculus III 4
Mth 256 Applied Ordinary Differential 4
Mth 261 Introduction to Linear Algebra 4
Ph 221 General Physics (with Calculus) 3 I
General Physics (with Calculus) 3
II
$\begin{array}{ll}\text { Ph } 223 & \text { General Physics (with Calculus) } \\ & \text { III }\end{array}$
$\square$4
4444
4

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
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

## 2. Have a minimum technical GPA of 2.25

(TechnicalGPA is based on an average of all major-related classes taken prior to admis sion).

## Continuation Criteria

After admission 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 Cor better 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 for each course;
4. Receive no more than one student code of conduct violation.

## Appeals

Students denied admis sion to or suspended from the 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 admission or suspension.

## Pass/No Pass Grading Policy

All courses specifically required by the University or by the Electrical Engineering and Computer Engineering 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 Univers ity Studies. ( 15 credits Freshmen Inquiry, 12 credits Sophomore Inquiry, and 12 credits Upper-division Cluster.)
2. Transfer students meet the requirement by having Wr 121, Comm 220, and 39 credits as a combination of Univers ity Studies courses and liberal arts/social science transfer credits. (At a minimum the 12 credit upper-division cluster must be taken at PSU. Please contact ECE 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. Classes 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 overall GPA, which includes all courses taken at PSU, greaterthan 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 ortransferred. 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 program is 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 provide a comprehensive background in the electrical sciences and offers an opportunity for specialization in the areas of analog/RF circuits, digital/VLSI design, electromagnetics, microelectronics, power engineering, and signal processing. This programprovides the student with the educational background necessary for employment in virtually all electrical engineering fields. Majors in electrical engineering mustcompletethe 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 for Ph 202 or Ph 212 or Ph | 1 |
|  | 222 orPh 232 |  |
| Ph 216 | Lab for Ph 203 or Ph 213 or Ph | 1 |
|  | 223 orPh 233 |  |
|  | Sophomore Inquiry | 12 |
| Subtotal: 51 |  |  |
| 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 electives are ECE 323, EE 348, ECE 351, ECE 361, ECE 362, ECE 372, ECE 373.

## Senior year

ECE 411
Industry Design Processes
ECE 412
Senior Project Development I
ECE 413 Senior Project Development II

| ECE 424 | Engineering Professional | 2 |
| :--- | :--- | :--- |
|  | Practice |  |
|  | Junior or senior ECE electives | 8 |
|  | Senior ECE electives | 4 |
| Ec 314U | Upper-divis ion cluster | 8 |
|  | Private and Public Investment | 4 |
|  | Analysis |  |

Subtotal: 34
Ec 314 U is a required course contained within some upperdivision clusters.

Junior-levelECE electives are ECE 323, EE 348, ECE 351, ECE 361, ECE 362, ECE 372, ECE 373. 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 ComputerScience in the area of electrical engineering.

## REQUIREMENTS

A student wishing to minor in this area should complete, with a minimum grade ofC, and a minimum GPA of 2.25, a designated set of courses as follows:

| Cours es |  |  |
| :--- | :--- | :--- |
| 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 admission 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 Computer Engineering program is 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 provide a comprehensive background in computer engineering 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 thestudent with the educational background necessary for employment in virtually all branches of the digital electronics and computer industry. Majors in computer engineering must complete the following Univers ity and departmental degree requirements. Any deviation from the required courses must be approved by the department.

## REQUIREMENTS

| Fres hman 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 for Ph 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 for Ph 203 or Ph 213 or Ph | 1 |
|  | 223 orPh 233 |  |
|  | Sophomore Inquiry | 12 |


| 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 System Organization | 4 |
| ECE 362 | Embedded Operating Systems | 4 |
| ECE 371 | Microprocessors |  |
| ECE 372 | Microprocessor Interfacing and | 5 |
| ECE 373 | Embedded Systems <br>  <br>  | 5 |
| Stat 351 | Device Drivers <br> Probability and Statistics for <br> Electrical and Computer <br> Engineering <br> Junior ECE electives | 4 |

Subtotal: 46
Junior-levelECE electives are ECE 322, ECE 323, ECE 315, ECE 316, EE 347, EE 348, ECE 331, ECE 332.

| Senior year |  | 2 |
| :---: | :--- | :--- |
| ECE 411 | Industry Design Processes | 4 |
| ECE 412 | Senior Project Development I | 2 |
| ECE 413 | Senior Project Development II | 2 |
| ECE 424 | Engineering Professional | 2 |
|  | Practice | 4 |
| ECE 485 | Microprocessor SystemDesign | 4 |
| ECE 486 | Computer Architecture | 4 |
|  | Junior or seniorECE elective | 4 |
| Ec 314U | Private and Public Investment | 4 |
|  | Analysis |  |
|  | Upper-division cluster | 8 |

Subtotal: 34
Ec 314 U is a required course contained within some upperdivision clusters.

Junior-levelECE electives are ECE 322, ECE 323, ECE 315, ECE 316, EE 347, EE 348, ECE 331, ECE 332.
The junior- or senior-level elective 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 Engineering 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. Admission 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 Programapplication form;
- official transcripts of all university work;
- letters of reference fromat least two ECE faculty members; and
- statement of interest indicating reasons forseeking admission to the honors program.
After admission, 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 ofECE 403 Honors Thesis with a minimum grade of + (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 forstate-of-theart design is much greater than 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 who enters the field with a BS degree is expected to obtain a Master's degree as part of his/her long termcareer advancement. Graduates who enter the profession with Master's degrees start with cons iderably highersalaries 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 programs ignificantly 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 MSECE degree.

## 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 basis 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 upper division major GPA with at least 16 credits of upper division ECEclasses


## Admission process and program flow

Applications forthis programwill 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 cours ework 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 just an 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 canbe 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 Engineering

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 en gineering, and a grade point average of 3.00 or better in all juniorand senior-level technical courses will be directly cons idered 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 div is ion technical coursework below 3.00 but higher than 2.75 may be granted conditional admis sion 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 undergraduateECE classes as a Post-Baccalaureate studentto 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 admission 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 accredited university 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 students 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 Philos ophy in Electrical and Computer Engineering

Applicants to the Ph .D. programin electrical and computer engineering will normally have completed a master's degree in electricalengineering or a related field. However, admission directly to the Ph.D. program froma 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 member has agreed to serve as theadviser. Before applying to our PhD program, you should contact faculty working in an area of research that is of interest to you. Your adviser will stay the same throughout your time in the doctoral program. You can find a list of our faculty on our webs ite. The department has many ongoing 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.

## Master of Science (M.S.)

Thesis 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 levelcredits. 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 admission.

## THESIS OPTION

Thes is M.S. students usually follow one of the graduate track study plans consisting of four core courses (16 credits), two depth and breadth courses ( 8 credits), 9 credits of thesis, and 12 elective credits. Elective credits may include additional EE and ECE graduate courses, ECE 501-509 credits, or, with adviser approval, graduate classes from another department. Only 3 credits of ECE 507 may be counted as elective credits. A student may substitute an appropriate alternative class or classes for core ordepth classes in a track by obtaining written permis sion from his/her advis er before taking the class(es).
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 thesis approved by the student's thesis committee. The
defense is public and its schedule must be posted in the Electrical and Computer Engineering Department at least two weeks in advance. Pleasecontact the Graduate Coordinator to schedule the defense and announcement. See the department's web site for additional information 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 classes. 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 for students to develop a customtrack with their faculty adviser and approval by the Graduate ProgramDirector. The coursework-only option requires students to complete sixteen credits ofEE and ECE graduate lecture classes that forma core specialization area, sixteen credits of EE and ECE graduate lecture classes that provide depth and breadth, four credits of elective EE and ECE graduate lecture classes, and nine credits of approved graduate electives.

## APPROVED TRACKS

In addition to completing theother requirements for the degree, all students will take the core courses ( 16 credits) within their selected track. The core courses for each track are listed below.

Students pursing the thesis option will take two courses (8 credits) from the depth and breadth course list. Students pursing the coursework-only option will take four courses ( 16 credits) from the depth and breadth course list. The depth and breadth course lists are available fromthe department.

## ANALOG, RF, AND MICROWAVE CIRCUIT DESIGN

| Core |  |  |
| :--- | :--- | :--- |
| ECE 521 | Analog Integrated Circuit Design | 4 |
|  | I |  |
| ECE 522 | Analog Integrated Circuit Design | 4 |
|  | II | 4 |
| ECE 531 | Microwave Circuit Design I | 4 |
| ECE 532 | Microwave Circuit Design II | 4 |
| COM M UNICATIONS |  |  |
| Core |  | 4 |
| ECE 518 | Linear SystemAnalysis I | 4 |
| ECE 519 | Linear SystemAnalysis II |  |
| ECE 561 | Communication Systems Design | 4 |
|  | I |  |
| ECE 562 | Communication Systems Design | 4 |
|  | II |  |

COMPUTER ARCHITECTURE AND DESIGN
Core
ECE 585 Microprocessor SystemDesign 4
ECE 586 Computer Architecture 4
ECE 587 Advanced Computer 4
Architecture I
ECE 588 Advanced Computer 4
Architecture II
DESIGN AUTOMATION TRACK
Core
ECE 516 Integrated Circuit (IC) 4 Technologies
ECE 528 VLSI Computer-Aided Design 4
ECE 529 CAD for ULSI and Emerging 4 Technologies
ECE 583 Low Power Digital IC Design
4
DESIGN VERIFICATION AND VALIDATION
Core
ECE 571
Introduction to SystemVerilog
4 for Design and Verification
ECE 585 MicroprocessorSystemDesign 4
ECE 593 Fundamentals ofPre-Silicon 4 Validation
ECE 595
Emulation and Functional

## DIGITAL IC DESIGN, TEST, AND VALIDATION

Core
ECE 525 Digital Integrated Circuit Design 4
I
ECE 526
Digital Integrated Circuit Design
4 II
ECE $540 \quad$ System-on-Chip Design with FPGAs
ECE 581 ASIC: Modeling and Synthesis

## EM BEDDED SYSTEMS

Core
ECE 540
System-on-Chip Design with
4
FPGAs
ECE 544
Embedded SystemDesign with
ECE 558
Embedded Systems
4
Programming
ECE 585 Microprocessor SystemDesign 4
M ICRO AND NANO TECHNOLOGY
Core
ECE 514 MicrosystemIntegration and
ECE 515 Fundamentals ofSemiconductor
ECE $516 \quad$ Integrated Circuit (IC) 4 Technologies
ECE 517 Nanoelectronics

## SIGNAL PROCESSING

## Core

EE 520 RandomProcesses 4
EE 521 Discrete Time Processing I 4
EE 522 Discrete Time Processing II 4
EE 529 Signal ProcessingPracticum 4

## ELECTRICAL AND COMPUTER ENGINEERING PH.D.

## Doctoral Degree (Ph.D.) in Ele ctrical and Computer Engine ering

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 80 graduate credits consisting of at least 45 ECE graduate credits, 8 elective graduate credits and at least 27 credits of ECE 603 (dissertation). Of the 45 ECE credits, 32 credits must come fromECE lecture courses (24 lecture credits ifthe student successfully completed an ECE MS Thes is). The 8 elective credits may come from any academic department, but must be lecture credits only.

Each Ph.D. must have at least one journal publication. Specific course requirements depend on the student's area of emphasis, and the student's programmust be approved by his/her academic adviser. Students in the Ph.D. program in Electrical and Computer Engineering are required to pass a comprehensive examination (written or oral) after completing a substantial amount of coursework. They are also required to obtain approval of their proposed research plan by their doctoral committee before they can be advanced to candidacy. A dis sertation containing a real contribution to knowledge based on the candidate's own investigation and a final oral dissertation defense are required. The dis sertation must show 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 Computer Engineering Department at leasttwo weeks in advance. Please contact the Graduate Coordinator to schedule the defenseand announcement.

Lecture courses taken under the undifferentiated grading option ( $\mathrm{P} / \mathrm{NP}$ ) shall not be used to satisfy any graduate degree programrequirements. All coursework must be completed with a grade ofB-or better.

Students should choosea research topic and adviser for their dissertation; information on res earch in the departmentcan be found HERE.

## Check List for Ph.D. Degree Requirements

1. Appointment of the Adv isory Committee
2. Study Plan Approved by the Advis ory Committee
3. Comprehensive Exam Passed
4. Doctoral Dissertation Committee Approved
5. Residency requirement
6. Dissertation ProposalApproved
7. Advancement to Candidacy
8. Minimum of 3 years beyond BS degree
9. Journal Publication Requirement
10. Final Oral examination-Dis sertation Defense
11. Dissertation Signature Page

## 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.-Manufacturing Engineering Management
- Ph.D.-Technology Management
- Graduate Certificates

Strong managementskills are increasingly important to technical professionals. Managing R\&D projects, technological systems, technical organizations and resources, and other professionals requires management knowledge and skills.

Engineers and scientists are faced with these challenges very early in their careers. Typically, within three to seven years after graduation, they find themselves addressing complex issues 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 theirtechnical backgrounds - the Department of Engineering 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. We also address the needs of those wishing to continue their engineering/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 Business Adminis tration, and several other relevant academic disciplines. By utilizing the diverse faculty resources of Portland State University, the programoffers the opportunity to study the human, technical, and analytical aspects 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 Scie nce in Engine ering and Technology Management

In addition to meeting general University admis sion requirements (p.51), applicants to the programare required to havea baccalaureate degree in engineering or related discipline, background in probability/statistics, and four years of professional experience. Admission is granted to applicants who are judged to have a higher potential as reflected by their pastacademic performance and professional experience. Any variation from these requirements must be approved by the ETM department.

## Graduate Certificate in New Product Development, Strategic Management of Technology, Technology Management, Project Management, and Technological Entre prene urship

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 522 Communication and Team ..... 4 Building
ETM 530 Decision Making4
ETM 535Advanced Engineering4
Economics
ETM 540 Operations Research ..... 4
ETM 545 Project Management ..... 4
ETM 555 ..... 4
Capstone requirement (one of the following; $\mathbf{4}$ credits or 8 credits with thesis option):
ETM 506 Capstone Project 4
ETM 590 Engineering and Technology 4 ManagementSynthesis ETM 503 M.S. Thesis

## Electives ( $\mathbf{2 0}$ credits or $\mathbf{1 6}$ credits with the thesis option)

The Engineering and Technology Management Department offers a wide range ofelective courses. In addition, students may choose electives in several other programs throughoutthe University with the approval of their adviser.

## TECHNOLOGY MANAGEMENT, PROJECT MANAGEMENT, AND MANUFACTURING ENGINEERING MANAGEMENT

These Master of Engineering 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 statementof 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. program in Technology Management consists ofthe following ninesteps:
(Step-1): Admiss ion 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. Allcourses 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 described below.

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 research area, including Communications and Team-building, Strategic Planning, Manufacturing Systems Engineering, Manufacturing Systems Management, Total Quality Management, Technology Forecasting, Managing Intellectual Capital, Ethical Issues 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, MIM 524: 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: Environmental Economics.
METHODOLOGY: at least 20 credits fromthe following courses: Decis ion Making, Advanced Engineering Economics, Benchmarking Using Data Envelopment Analysis, Operations Res earch, Manufacturing Systems Simulation, Research Methods for Engineering and Technology Management, Technology Forecasting, Decis ion Support Systems: Data W arehousing, Project Management Tools, Strategic Intelligence, Psy 621: Univariate Quantitative Methods, Psy 622: Multiple Regression \& Multivariate QuantMethods, Psy 623: Factor Analysis \& Covariance Structure Modeling, Psy 593: Decision 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: Bus iness Process Modeling and Simulation, USP-655: Structural Equation 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 nationalor 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 from the ETM faculty and formation of the $\mathrm{Ph} . \mathrm{D}$. 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 dissertation credits while conducting research after successful completion of the comprehensive exam.
(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 DEVELOPMENT MANAGEMENT

| You must take four of the following courses: |  |  |
| :--- | :--- | :--- |
| ETM 543 | Front End Management forNew <br> Product Development | 4 |
| ETM 547 | New Product Development | 4 |
| ETM 549 | Management ofTechnology | 4 |
|  | Innovation |  |
| ETM 555 | Technology Marketing | 4 |
| ETM 556 | User-Centered Innovation | 4 |
| ETM 558 | Engineering Financial | 4 |

Total Credit Hours: 16
PROJECT MANAGEMENT

| You must take four of the following cours es: |  |  |
| :---: | :--- | :--- |
| ETM 522 | Communication and Team <br>  <br> ETM 5uilding | 4 |
| Strategic Planning | Str | 4 |


| ETM 544 | OrganizationalProject <br> 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 cours es: |  |  |
| :---: | :--- | :---: |
| ETM 526 | Strategic Management of <br> Technology | 4 |
| ETM 527 | Competitive Strategies in | 4 |
| ETM 530 | Technology Management | 4 |
| ETM 534 | Technology Roadmapping | 4 |
| ETM 536 | RDM: R\&D Management | 4 |
| ETM 575 | Science and Technology Policy | 4 |

Total Credit Hours: 16
TECHNOLOGICAL ENTREPRENEURSHIP

| You must take four of the following courses: |  |  |
| :--- | :--- | :--- |
| ETM 531 |  | 4 |
| ETM 535 | Acquisition <br> Advanced Engineering | 4 |
| ETM 548 | Economics <br> Managing New Technology | 4 |
| ETM 561 | Introduction |  |
| ETM 562 | Nechnology Entrepreneurship | 4 |
| ETM 573 | Managementof Intellectual <br> Capital | 4 |
|  | 4 |  |

Total Credit Hours: 16
TECHNOLOGY 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 |
|  | Technology |  |
| ETM 532 | 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 Science in Materials Science and Engineering (MSMSE)
- Doctorate in Mechanical Engineering (PhD)

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 ofScience in Mechanical Engineering (BSME) programis a $2+2$ program. Students spend their first two years taking lower-division courses in math, science, andengineering. At the end oftheir sophomore year, students apply for admission into the BSME upperdivis ion program.
Students admitted to the BSME upper-division program will be placed on one of two course plans fortheir junior year. These two course plans are the ME313 First Course Plan and the ME 320 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 assigned course plan, a student is able to complete the BSME in four years. As a reminder, the Department requires students to completeall highlighted classes with a grade of'C' or better, prior to applying for admiss ion 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 thatsets standards for engineeringeducation 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 curriculumh as the following Program Educational Objectives:

Graduates are employed as mechanical engineers 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 administrators, and the MME Industrial 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 BSME degree.

## M ME ADMISSION REQUIREMENTS

For students applying for 300-level MME course admission FALL2022

## Terms of Admission \& Deadlines

- 

Fall admissiononly
-
Application deadline is April 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/admissions/undergraduate-admis sions

## Minimum Eligibility for Consideration

All required/shaded classes on the BSME course plan completed prior to fall 2022 with a grade of C or better. A C- will not countas meeting admis sion criteria.

## -

A Selective Admis sionGPA of 2.25 or higher. The Selective Admis sionGPA 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 who began PSU as freshman) or Wr 121 and Comm 220 (for trans fer students) must be completed prior to fall

## Selective Admission

- 

All students who meet the minimumgrade requirement and have no more than 6 required/shaded
-
Selective Admis sion GPA courses outstanding as of April 15,2022 will be considered. The outstanding
-
courses must be completed prior to the start of fall term. Examples:
$\stackrel{\bullet}{\mathrm{OK}=}$

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


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 2.50 or
above will be conditionally admitted into the program. Conditions will be the completion of outstanding required courses, outlined in the admission letter. A 'pending spring grades' decis ion will be relayed to students with a Selective GPA below 2.50. Trans fer 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 Admis sion GPA.
-
If a conditionally admitted student does due diligence and cannot locate the necessary
course(s) at PSU or local community colleges, it is possible thecondition may be extended through end of fall. Extension must be approved by the MME Academic Advis or. Official transcripts must be provided to both PSU Admissions 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, 2022. Decis ions will be:

Admit

Conditionally Admit
-
Pending spring Grades (official decis ion will be sent after spring grades are evaluated)
-
Deny (students may request a meeting with the MME Academic Advisor to review decision)

## Repeated Classes

- 

Standard PSU repeat/replace policy applies to Selective AdmissionGPA:
-
If a student earned a $\mathrm{D}+$ or below in a class the first time, then only therepeated (second) grade will be used in the Selective GPA calculation
f a student earned 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 attemptregardless of either grade

## Additional Testing

- 

No test required

## Pass/No Pas s

- 

Required clas ses must be 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 admission GPA as an F and the course mustbe 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 els ewhere

## 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 2023 admis sion requirements available spring 2022 (in time for fall 2022 registration in May 2022)

## 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 StrengthofMaterials 4
EAS 215 Dynamics 4
ECE 241 Introductionto Electrical 4 Engineering
ECE 241L Introductionto Electrical Engineering Lab
ME 120 An Introduction to Engineering
ME 121 Introductionto Systems and 3 Control
ME 122 Introductionto Design 3
Mth 251 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 General Physics (with Calculus) 4
Ph 212 General Physics (with Calculus) 4
II

Ph $213 \quad$ General Physics (with Calculus)
Ph $214 \quad$ Lab for Ph 201 or Ph 211 or Ph 221 or Ph 231
Ph $215 \quad$ 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
Freshman Inquiry
Ph 221, 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 admission to the BSME Programstudents will be expected to make satis factory progress to ward 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 consecutiveterms 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 three consecutive 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 mustbe made within 30 days ofdenial of admission 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 Univers ity 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 Introduction to Systems and 3
ME 122 Introductionto Design 3
Mth 251 Calculus I 4
Mth $252 \quad$ Calculus II 4
Mth 261 Introduction to Linear Algebra 4
Approved Science elective 4
Freshman Inquiry 15
Subtotal: 50
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 ofMaterials | 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 |
|  |  |  |
| Ph 212 | General Physics (with Calculus) | 4 |
|  | II |  |
| Ph 213 | General Physics (with Calculus) | 4 |
|  | III |  |
| 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 orPh 233 |  |
|  | Sophomore Inquiry | 12 |
| Subtotal: 51 |  |  |
| Junior year |  |  |
| BA 306U | Essentials of Finance for Non- | 4 |
|  | Business Majors |  |
|  | or |  |
| Ec 314U | Private and Public Investment | 4 |
|  | Analysis |  |
| ME 213 | Properties of Materials | 4 |
| ME 213L | Properties of Materials Lab | 0 |
| ME 240 | Survey of Manufacturing | 2 |
|  | Processes |  |
| ME 240L | Survey ofManufacturing | 0 |
|  | Processes Lab |  |
| ME 250 | Geometric Modeling | 2 |
| ME 250L | Lab for ME 250 | 0 |
| ME 313 | Analysis ofMechanical | 4 |
|  | Components |  |
| ME 314 | Analysis and Design of Machine | 4 |
|  | Elements |  |
| ME 320 | Fluid Mechanics | 4 |
| ME 320L | Fluid Mechanics Lab | 0 |
| ME 321 | Engineering Thermodynamics I | 4 |
| ME 322 | Applied Fluid Mechanics and | 4 |
|  | Thermodynamics |  |
| ME 323 | Heat Transfer | 4 |


| ME 350 | Programming and Numerical | 2 |
| :--- | :--- | :--- |
|  | Methods |  |
| ME 351 | Vibrations and SystemDynamics | 4 |
| Wr327 | Technical Report Writing | 4 |

Subtotal: 46

| Senior year <br> ME 370 | Mechanical Engineering <br> Profession | 2 |
| :--- | :--- | ---: |
| ME 411 | Engineering Measurement and <br> ME 411L | InstrumentationSystems <br> Engineering Measurementand <br> ME 488 |
| InstrumentationSystems Lab | 4 |  |
| ME 491 | Design of Experiments | 0 |
| ME 492 | Design Process | 4 |
| ME 493 | Conceptual Design Project <br> Detailed Design Project <br> Approved mechanical | 2 |
|  | engineering electives | 4 |
| Upper-division cluster | 4 |  |
|  |  | 16 |
|  |  | 8 |

Subtotal: 44

## 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:

| ME 401 | Research | $1-6$ |
| :--- | :--- | ---: |
| ME 404 | CooperativeEducation/Internship | $1-12$ |
| ME 405 | Reading and Conference | $1-6$ |
| ME 406 | Special Projects | $1-6$ |

Further, students can take one MCECS non-ME400/500*level course and apply it toward elective credits. Students can take an additional MCECS non-ME course, 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 Form and waive their ability to apply the course(s) to a graduate program.

## HONORS TRACK

## Entry Requirements

- 

Admission to the BSMEProgram
-
Minimum PSU 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 interestareas

## Application Deadline -

Students must apply by the end of the third termof 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 mechanical engineeringelective)
-
Presentation of research to MME faculty and students in a seminar format
-
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 Thesis research, conducted in a specialty area within Mechanical Engineering. Students who successfully complete the MME Honors 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 admittedBSMEstudents 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 term of their junior year, and if admitted, will automatically matriculate into an MME graduate programas long as they meet the pathway continuation criteria. Students in the Pathway Programcan pursueany of the MME master-levelgraduate programs.
*Post-bacstudents 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 programwithin 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 BSME coursework
-
Institutional GPA of 3.3 at time of application
-
Three letters of recommendation fromfaculty members (MME faculty members preferred)
-
Statement of purpose

## Continuation Criteria

Students must have a combined undergraduate and graduate institutional GPA of 3.3 upon graduation from the 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: Master of Science in Mechanical Engineering (MSME), Master of Science in Materials Science (MSMSE), and PhD in Mechanical Engineering. Each programis designed to help students achieve career goals, meeting industry, or research interests.

Master's students who plan to work or who are currently working in industry have the ability to earn a master's degree by completing coursework and foregoing research, while students seeking res earch opportunities or advancement to a PhD programhave the option to perform research with a variety of faculty members, and complete either a thesis 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 Scie nce in Mechanical Engineering (MSME)

Applicants who have received a Bachelor ofScience degree, and who meet University graduate admission requirements, will be considered for admission as outlined below:

Regular admission:

- Applicants who have a Bachelor ofScience in MechanicalEngineering or in a closely related engineering field
- Applicants who have a Bachelor ofScience in a related field such as materials science, physics, chemistry, or biology who have als o completed the following undergraduate courses (or equivalents) based on focus area:
- Design \& Manufacturing: ME313 Analysis of MechanicalComponents, 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 ofScience degree in a related field such as materials science, physics, or chemistry, but have not completed the recommended pre-admission courses lis ted 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.

## Master of Science in Materials Science and Engine ering (MSMSE)

Applicants who have received a Bachelor ofScience degree, and who meet University graduate admission requirements, will be considered for admission as outlined below:

## Regular admission

- Applicants who have a Bachelor ofScience in Material Science \& Engineering or in a closely related engineering field
- Applicants who have a Bachelor ofScience in a related field such as mechanical engineering, physics, chemistry, or biology who have also completed the following undergraduate course (or equivalent):
- ME 213/L Properties of Materials

Conditionaladmission:

- Applicants who have received a Bachelor ofScience 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 Engineering (PhD)

A Master of Science degree in Mechanical Engineering, or a closely related field, is required for students applying to the mechanical engineering PhD program. Applicants will need to provide three letters ofrecommendation, a statement of purpose, a resume or curriculumvitae, 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 MME departmentweb site at
https://www.pdx.edu/mechanical-materials-engineering/.

We require that qualified PhD applicants be assigned 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, and FEM applications in mechanical design.

Candidates mustmeet the requirements of the University and the Department for the MSME degree. The program offers three tracks: thesis, projectand coursework-only. For all tracks, candidates must complete 45 graduate credits, which include ME 551 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 ofME 501, ME 503, ME 504 (maximum 6 credits), ME 505, and ME 506 to their degree. Candidates may apply a maximum of 8 credit hours of approved non-mechanical engineering credits to ward their electives.

All candidates mustsubmit a study plan approved by their advis or by the beginning of their third term. Updates to the study plan may be requested by theadvisor 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 programs tructure encourages students to explore research notonly in conventional disciplines, but also in inter- or multi-disciplines. There are many research thrusts in this programthatspan a wide range ofcutting-edge and cross-dis ciplinary areas.

Candidates must meet the requirements of the University and the Department for the MSMSE degree. 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 fromME 513 (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 ME 507 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 total of 6-9 MSE 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 thestudent 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 canbe chosen fromelectives recommended by the student programcommittee. For all tracks, a maximum of two credits of ME 507 or approved seminar can be applied to the degree.
Each student is assigned to an advisorupon acceptance to the program, and the advisor will be the primary contact for the student in the Department. Thestudent program committee, a group of three faculty members, will meet with each student twice per year to review the course of study that thes tudent and advisor have chosen and to monitor overall programquality.

## DOCTORATE IN MECHANICAL ENGINEERING

The PhD program in Mechanical Engineering aims to educate technical experts and researchers to fill leaders hip roles in industry, research and education. The program culminates in a written dissertation 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 University requirements for the degree in addition to the requirements listedbelow.

In addition to the University doctoral degree requirements (p. 54), the programrequirements include a minimum of

27 credit hours of Mechanical Engineering coursework, a
comprehensive examination, prospectus defense, 27 credit hours ofdis sertation (ME603) and final dis sertation defense. The 27 credit hours of Mechanical Engineering coursework must consist of a minimum of 8 credits of $600-$ level courses, which can include up to 3 credits of ME 607 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-levelcourses 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:

| ME 577 | Introductionto Semiconductor | 4 |
| :--- | :--- | :--- |
|  | Manufacturing |  |

## Choose three of the following:

ME 513 Engineering Material Science

ME 528 Scanning Electron Microscopy
for Materials and Device Characterization
ME 529 Transmission Electron
Microscopy andChemical
Analysis of Materials
ME 547 Transfer and Rate Processes 4
ME $576 \quad$ Materials Failure Analysis 4
ME 578 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 advanced study and research, including preparation for academic or professional careers, continuation and improvement of skills for in-service professionals, personal intellectual enrichment, 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 Schooloversees the University's graduate programs in the interest ofensuring quality instruction and research and promoting the highest achievement of graduate students. It is the principal resource concerning graduate admis sion policies and procedures, advanced degree requirements, degreestatus, petition procedures, thes is 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 responsible 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 professionals the opportunity to deepen their understanding of futures thinking and foresight practice to positively impact a highly volatile and complexlandscaperecently referred to as "post-normaltimes." Given rapid and exponential acceleration that is occurring across both public and privatesectors, a new mindset and new skills are needed to navigate this complexity and build success pathways to desired futures. Increasing "readiness for the future" has become an urgent call 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 interdis ciplinary social science comprised of psychology, sociology, anthropology and social work, the arts, political science, business, technologicalstudies, urban studies, public administration, engineering and technology sciences, economics, and other geo-political focal areas (to name a few). Futures thinking and foresight practicereflect a collection of applied skills and tools related to a specific typeof 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 foresight research and methods and profiles offuturists who lead these processes. With a special focus on leading efforts to build fores ightfulness within communities and/or organizations through trend mapping, power analysis, goal setting in a "VUCA" practice environment (volatility, uncertainty, complexity and ambiguity), students learn the fundamentals of engaging individuals, groups and organizations 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 fores ight 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 | Introduction to Foresightand | 4 |
| ISt 521 | Futures Practice <br> Applying Foresight Frameworks <br> and Building Futures Practice | 4 |
| ISt 522 | Integrative Futures Practice | 2 |
| Electives (8 credits) |  |  |
| Approved list ofelective 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 Measurement for Social Innovation | 4 |
| PA 513 | Administrative 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-basedManagement I | 3 |
| SW 510 | Futures Thinking and Foresight Practice for Equity, Well-Being and Community Flourishing | 3 |
| $\begin{aligned} & \text { USP } \\ & 560 / \text { EMCR } \\ & 560 \end{aligned}$ | Climate Resiliency Planning | 3 |

Other courses may be used as electives with approval of the ProgramDirector.
Total Credit Hours: 18

# University Honors College 

University Honors College
1632 SW 12th Ave.
503-725-4928
www.pdx.edu/honors
honors@pdx.edu

## Honors in the City

Univers ity Honors College combines the benefits and rigor of a small liberal arts college with the opportunities and resources of a large urban research university. The College centrally engages Portland State's mis sion to "Let Knowledge Serve the City," drawing on PSU's institutional commitment to community engagement, sustainability, and internationalization as well as its civic leadership and location in downtown Portland. The Honors College serves high-achieving, 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 intensive interdisciplinary 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 Univers ity 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 Urban Honors application questions available as partof the PSU undergraduate application. Current PSU students wis hing 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 juniory ears. Students wishing to transfer into Honors as seniors should contact the

Univers ity 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.
Minimum criteria for admission:
First-year students (entering from high school):

- 3.50 cumulative unweighted high school GPA OR
- 1200 on the SAT

OR

- 27 on the ACT


## Transfer/Current PSUstudents:

- Cumulative GPA of 3.25 or higher in college-level courses


## 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 publis hed on PDX.Scholar, PSU's open source thesis and dissertation database.
Honors students must meet the undergraduate degree requirements setby the University, including those governing totalcredits 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 cumulativePSU GPA of 3.25 or higher 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 Social Science
- The sequence fulfills the Univers ity's lower division writing requirement, and meets the requirement for Wr 121.
- First year students mustcomplete the Global City sequence regardless of the number of $\mathrm{AP} / \mathrm{IB}$ credits they may have completed.
- Incoming first year transfer students with 29 or fewer college credits must complete the Global City sequence.Second Year: Urban Discourses (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 lowerdivision writing requirement.
- Students entering Honors with 30-79 college credits should begin with the second year curriculum; all three courses are required. It is recommended that transfer students begin with HON 202.Junior Year: Theory \& Practice (12 credits)
- Transfer students must begin with the 4-credit Hon 399: Honors Writing. This course counts towards the 12-credit third year requirement for transfer students entering at the junior level or above.
- Hon 399: Honors Writing 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 seminars (Hon 407), internships (Hon 404), research (Hon 401), departmental honors seminars, or approved study abroad courses.
- Students entering Honors with $80+$ credits are required to take HON 202 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: Thes is Prospectus (4 credits); Hon 403: Thes is Continuation ( 4 credits); public presentation and defense
- Hon 403: Thes is 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.


## FIRST YEAR: FOUNDATIONS (15 CREDITS)

The Global City: Hon 101, Hon 102, Hon 103 (15 credits)
This year-long sequenceserves as a foundations course and provides the basic intellectual framework for the social, cultural, political, and material study of the urban environment. "The GlobalCity" introduces the means to think critically about the urban environment and the interdependence between the city and the global world. The sequence fulfills the university's lower division writing requirement, and meets the requirement for 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 coursecommunity, 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. "The GlobalCity" 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)

Urban Discourses: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 developnotonly their understanding of the systems by which cities operatebut also their own critical capacities as urban residents and knowledge producers. Class size limited to 30 .

## 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 analysis of cultural artifacts and texts placed in cultural and his toric contexts. Disciplinary approaches may include History, Languages and Literatures, Art History, Film Studies, Gender Studies, Cultural Studies, 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 399 (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 399 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 classes 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 (4 credits -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 theopportunity to gain experience, apply their academic learning, and make connections through approved cooperative education/internships. During their internship, students must enroll in and complete theonline 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.
Res earch: 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 Thesis: Prospectus seminar, in which they identify their advis or and write their thesis prospectus. Upon successful completion of the Prospectus course, thestudent enrolls in one or more Hon 403 Thesis: Continuation sections, in which they complete their thesis. 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 Thes is: Prospectus is an approved Writing Intensive 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, Interim Associate Dean for Undergraduate Engagement
Heejun Chang, Interim Associate Dean for Research \& Graduate Programs

341 Cramer Hall, 503-725-3514
www.pdx.edu/liberal-arts-sciences/
The College ofLiberal 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 liberal education 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 fromtheir college experience.
The instructional units of the college include Anthropology (p. 207), Applied Linguistics (p. 211), Biology (p. 215), Black Studies (p.221), Chemistry (p.222), Chicano/Latino Studies (p.227), Communication (p. 228), Conflict Resolution(p.231), English (p.235), Environmental Science and Management (p. 244), Geography (p. 255), Geology (p.262), History (p.270), Indigenous Nations Studies (p.276), Judaic Studies (p. 279), Mathematics and Statistics (p.281), Philosophy (p.301), Physics (p.302), Psychology (p.316), Sociology (p.319), Speech and Hearing Sciences (p.321), Systems Science (p. 325), Women, Gender, and Sexuality Studies (p.329), and World Languages and Literatures (p.333).

## Undergraduate programs

## Baccalaure ate Degrees

The College of Liberal Arts and Sciences is a large and divers ified unit offering more than 20 majors (some with additional choices of sub-specialization), several academic certificates and teaching endorsements, and numerous departmentalminors.
The college also offers a selection of alternative programs for students who are highly motivated and who have a record of high scholarly achievement. 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 general education 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, science, or social science may do soby majoring in liberal studies. Fortheseoptions see Interdisciplinary Studies: Arts and Letters, Social Science (p. 277).)

## 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/Latino Studies; Conflict Resolution; English; Environmental Science and Management; Geography; Geology; Mathematics; Speech and Hearing Sciences, Systems Science; Women, Gender, and Sexuality Studies; and World 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/Latino Studies; 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 Special Education), Psychology; Sociology; Systems Science, Women, 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, Program Coordinator
Sarah Holliday, Event Coordinator

## Challenge Program

The Challenge Program is 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 Program currently offers introductory college courses in Chemistry, English, World Languages and Literatures, History, Mathematics, Geology, PSU Honors, and Computer Science. Course content is equivalent to that offered to Portland State University students on the home campus. College-leveltexts and materials are used.

Students who complete their Challenge Program cours ework are entitled to a regular Portland State Univers ity transcript. The credit earned by the studentcan be trans ferred 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 programofstudy that allows themto pursue their particular interest. The requirements of each discipline are listed under the departments that have theM.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 mostadvanced 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 one of 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 admission 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 ofESM/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 others imilar courses recommended by the Advisory 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);
- Dissertation 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 untiladvancing to candidacy.

## Dis sertation

The student mustsubmit a prospectus 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 Dissertation Committee and the Director of the Earth, Environment, and Society doctoral program. The research for the dissertation 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 ofteaching assistantships and res earch 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 termwithout formal leave of absence will be
assumed to have withdrawn from the degree programand will be formally dropped fromit. Students who fail to make satisfactory progress toward the degree may be dropped fromthe 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 circumstances, 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.221), Chicano/Latino Studies (p. 227), Indigenous Nations Studies (p. 276), and W omen, Gender, and Sexuality Studies (p.329). 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 space for excellence 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.207). 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. 221)

- B.A., B.S. in Black Studies
- Minor in Black Studies
- Post Baccalaureate Certificate in Black Studies

Chicano/LatinoStudies (p. 227)

- Minor in Chicano/Latino Studies
- Certificate in Chicano/Latino Studies

Indigenous Nations Studies (p. 276)

- B.A., B.S. in Indigenous Nations and Native American Studies
- Minor in Indigenous Nations Studies

Women, Gender, and Sexuality Studies (p. 329)

- 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


## GENDER, RACE, AND NATIONS GRADUATE CERTIFICATE

## CERTIFICATE REQUIREMENTS

| Core Courses (8 credits) |  |  |
| :---: | :--- | :--- |
| GRN 515 | Constructions ofPower and <br> Knowledge: Gender, Race, and <br> Nations | 4 |
| GRN 520 | Critical and Decolonizing <br> Research Methodologies | 4 |
| Approved Electives (16 credits) |  |  |
| GRN 530 | Social Justice Pedagogy <br> GRN 550 | Seminar in Gender, Race, and <br> Nations |
| BSt 5XX | All 500-level courses in Black <br> Studies | 4 |
| ChLa 5XX | All 500-level courses in <br> NAS 5XX | Chicano/Latino Studies <br> All 500-level courses in <br> Indigenous Nations Studies |
| WS 5XX | All 500-level courses in Women, <br> 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.
- Minor in Anthropology
- Secondary Education Program-Social Science
- M.A., M.S.

Anthropology is the study of biological and cultural divers ity 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 ourpast, 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 organizations, 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 Madagascar, Asia, Latin America, the Arctic, and western North America. Weare dedicated to applied research and scholarship that addresses realworld 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 our pedagogy, 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 REQUIREMENTS

Admission to the department is based on general admission to the University. See Admissions Requirements (p.8) for more information.

## Limitations

Students majoring in anthropology should consult a department advis er 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

| Anth 101 | Introduction to Biological | 4 |
| :--- | :--- | ---: |
| Anth 102 | Anthropology <br> Introductionto Archaeology <br> Anth 103 | Introductionto Social/Cultural <br> Anthropology |
| Anth 304 | Social Theory <br> or | 4 |
| Anth 305 | Culture and Power | 4 |
| Anth 345 | Practicing Anthropology <br> Anth 350 | Archaeological Method and <br> Theory |
| Anth 350L | ArchaeologicalMethod and <br> Theory Laboratory | 4 |
| Anth 370 | Paleoanthropology <br> or | 4 |
| Anth 372 | Human Variation <br> or | 1 |
| Anth 373 | Primate Ecology and Behavior | 4 |
| Ling 232 | Languageand Society <br> or | 5 |
| Ling 233 | Languageand Mind <br> or <br> Introductionto Linguistics | 4 |
| Ling 390 | or <br> Introductionto Probability and | 4 |
| Stat 244 | 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 ofthe 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).
Four of the required 20 elective credits may be taken on a pass/no pass basis; all other anthropology courses used to satis fy the departmental major requirements must be taken for a letter grade and must havebeen assigned a grade of C- or better. Courses taken outside the departmentas 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 Univers ity limitations on the maximum number of hours taken pass/no pass) or for a letter grade. However, students who take these courses 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 ofdepartmental requirements).

## ANTHROPOLOGY MINOR

## REQUIREMENTS

To earn a minor in anthropology a student mustcomplete 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 | Introduction to Archaeology <br> Anth 103 <br> Introduction to Social/Cultural <br> Anthropology | 4 |
| One of the following courses: (4-5 credits) |  |  |
| Anth 304 | Social Theory <br> Anth 305 | Culture and Power |
| Anth 350 | Archaeological Method and <br> Theory | 4 |
|  | And <br> Anth 350L | ArchaeologicalMethod and <br> Theory Laboratory |
|  | Paleoanthropology |  |
| Anth 370 | Puman Variation <br> Anth 372 <br> Anth 373 | Primate Ecology and Behavior |

> Three upper-division anthropology electives
(Upper-divis ion electives must include at least one 400level course, excluding courses numbered Anth 401, Anth 404, Anth 405, Anth 407)
Subtotal: 28-29
All anthropology courses used to satisfy the departmental minor requirements, whether taken in the department or els ewhere, must be graded C- or above. Students must eam a cumulative grade point average of 2.00 or better in all courses required for the anthropology minor (including those courses taken outside the department as part of departmental requirements).

## Graduate programs

The Department of Anthropology offers the degrees of Master of Arts and Master of Science. The programis designed to give thes tudent a graduate level of competence in general anthropology, including the major subfields ofbiological 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 have the 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 preparestudents 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 research and thesis, 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 withoutan 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 admission to graduatestudy, 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 musts ubmit 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 mustalso arrange to have three letters of recommendation indicating profes sional 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 Anth 570 | Core Seminar in Archaeology <br> Core Seminar in Physical <br> Anthropology | 4 |
|  | Graduate-level Anthropology <br> electives (2 courses) | 4 |
|  | Approved graduate-level <br> electives (Anth, non-Anth) | 9 |
|  | An adviser-approved, graduate- <br> Anth 501 501 | Thes course in research methods |
| Anth 503 | Thesis | 4 |
|  |  | 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-level Electives: At least two ofthese 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

Anth 550 Cultural Anthropology Core Seminar in Archaeology

| Anth 570 | Core Seminar in Physical <br> Anthropology | 4 |
| :--- | :--- | :--- |
|  | Applied Anthropology <br> Graduate-level Anthropology <br> electives (2 courses) | 4 |
|  | Approved graduate-level <br> electives (Anth, non-Anth) | 9 |
|  | An adviser-approved, graduate- <br> level course in research methods | 4 |
| Anth 503 | Thesis Internship Track | 6 |
| Anth 504 | CooperativeEducation/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 leasttwo of these courses (8 credits) must be in formally numbered graduate-level courses (i.e. courses numbered between 510-597 or 610697). With graduateadviser 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 coursenumbered 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 | Core Seminar in Physical |
|  | Anthropology <br> Graduate-level Anthropology <br> electives (3 courses) | 4 |
|  | Adviser-approved, graduate-level <br> methods electives (3 courses) | 12 |
|  | Graduate-levelNon- <br> Anthropology electives (2 | 8 |
|  | Anthrses) <br> cours 506 | Special Projects (Comprehensive <br> Exams + Portfolio) |

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 leasttwo of these courses (8 credits) must be in formally numbered graduate-level courses (i.e. courses numbered between 510-597 or 610-
697). With graduateadviser 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 termof admission 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) Pass ing a course equivalent to PSU level 203 or higher. The Department of World 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 equivalent should contact the Department of World Languages and Literatures during the first termafter their admission 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 to candidacy involves successful passing (a minimum grade ofB-) 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 termofwork.
4. For the thes is track, approval of a thesis 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 graduatecommittee. 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 admission to the program, but in no case later than the end of the seventh term(excluding Summer Session) following admis sion to the program. Students in the internship track should have an approved internship contract as soon as possible following admission 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. For students 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 thesis.
7. For students on the skills track, passing 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 OtherLanguages (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 basic knowledge of language structure intoa major in another field. The Certificate in Teaching English as a Second Language provides thorough undergraduatelevelpreparation for teaching. The MA 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 <br> credits |
| :--- | :--- |
| Adviser Approved Electives | 16 <br> credits |
| Typologically Different Language from <br> English/Language Structure Requirement | 8 credits |
| Total credits for Applied Linguistics B.A. <br> major | $\mathbf{6 0}$ <br> credits |

## REQUIRED COURSES 36 credits

## 300-level courses

Ling $390 \quad$ Introduction to Linguistics 4
Ling 391 Introduction to Applied Linguistics
Ling 392 Structure of the English
Language
400-level courses
Ling 407 Senior Seminar
Ling 411 Syntax
Ling 412 Phonology

| Ling 414 | Linguistic Pragmatics | 4 |
| :--- | :--- | :--- |
| Ling 416 | or |  |
| Discourse Analysis | 4 |  |
| Ling 415 | Linguistic Phonetics | 4 |
| Ling 435 | Theories and Practice in Applied <br> Linguistics | 4 |
| Ling 437 | First LanguageAcquisition <br> or <br> Second Language Acquisition | 4 |
| Ling 438 | Sco |  |

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 ofstudy.

## ADVISER APPROVED ELECTIVES 16 credits

Students should meet with the departmentalundergraduate 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 classroom should 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 count toward the major, students must get approval from the chair or the departmental undergraduate adviser.

Students planning to complete the TESL certificate 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 from English (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 termofa typologically different language and one language structure class.

All courses used to satis fy the department major requirements must be graded C or above. Courses taken pass/no pass are not acceptable toward fulfilling department major requirements. By the end of the first quarter of admission to the program, students mustconsult with the adviser to select the appropriate courses. On completion, the entire programmust als o 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 Introductionto Linguistics 4 Linguistics electives 24
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 another PSU department.
All courses used to satisfy the departmentminor requirements must be graded C or above. Courses taken pass/no pass are not acceptable toward fulfilling departmentminor 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 useful for 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, W orld Languages and Literatures, Communication, Education, and other social sciences. Students may enroll in the programas undergraduates or as post-baccalaureate students.

## Admission require ments

1. Admission to Portland State University.
2. English proficiency in spoken and written English if the student is not a native speaker of English (a TOEFL score report of 80 iBT or higher or an IELTS band score of 6.5 or higher is required for proofof proficiency).
3. One year proficiency in at least one foreign language if the student is a native speaker of English. (Note:Ifnot fulfilled at the time of admission, this requirementcan be fulfilled concurrently with the Certificate courses.)

## COURSE REQUIREMENTS

In addition to fulfilling minimum University requirements, the following courses are required:

## Courses

| 28 credits |  | 4 |
| :--- | :--- | :--- |
| Ling 390 | Introduction to Linguistics | 4 |
| Ling 392 | Structure of the English |  |
| Language | 4 |  |
| Ling 438 | Second Language Acquisition | 4 |
| Ling | Understanding the International | 4 |
| 471/Intl 471 | Experience |  |
| Ling 477 | TESOL Methods I | 4 |
| Ling 478 | TESOL Methods II | 4 |
| Ling 409 | Language Teaching Practicum | 4 |

All courses used to satis fy 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. Admission to graduatestudy at Portland State University.
2. Admission to the MA TESOL 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 American university, a minimum TOEFL iBT score of 100 or IELTS 7.0 is required for admission. 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 graduatestudy from the IELP.

Persons 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 program that 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 total of 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 oneof the three tracks.
For all tracks, students must complete either a four-credit Culminating Workshop course (Ling 566), in which they prepare their professional portfolio based on work throughout their MA, or a six-credit Thes is (Ling 503). All electives mustbe adviser approved.
Overview of Course Requirements for MA TESOL Tracks

| Track 1: | Track2: | Track3: |
| :--- | :--- | :--- |
| TESOL - | TESOL - | TESOL - |
| Standard | Language | Applied |
| Track | Assessment | Linguistics |
|  | Not |  |
|  | Required |  |


| Foundations <br> of Language | 12 <br> credits <br> Structure and | 12 credits | 16 credits |
| :--- | :--- | :--- | :--- |
| Use |  |  |  |

Total credits forall 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 <br> Phonology | 4 |
| :--- | :--- | :--- |
| Ling 521 | Applied English Grammar <br> Language, Identity, and Culture | 4 |
| Ling 531 | 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 | Language Teaching Practicum | 4 |

## Elective Courses

1 Language Use Elective 4
1 Language Education Elective 4
Research and Culminating Experience
Ling 565 $\begin{aligned} & \text { Research in Language Teaching } \\ & \text { and Applied Linguistics }\end{aligned}$
Ling $566 \quad$ Culminating Works hop for $\quad 4$
TESOL and Applied Linguistics
Ling 503 Thesis
6
TRACK 2: TESOL - LANGUAGE ASSESSMENT NOT REQUIRED

## Foundations of Language Structure and Use: Required Courses

Ling $513 \quad \begin{aligned} & \text { Applied Phonetics and } \\ & \text { Phonology }\end{aligned}$
Ling 521 Applied English Grammar
Ling 531 Language, Identity, and Culture

[^1]Ling $582 \quad$ Pidgins and Creoles
Ling 510 can be used only with adviser approval.
Language Education Courses

| Ling 509 | Language Teaching 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 and Materials | 4 |
|  | Development in TESOL |  |

Ling 510 can be used only with adviser approval.

The thesis will conform to departmental and university guidelines for details such as thesis proposalmeetings, defenses, and formatting.

All courses need to be passed with a grade of"B" or better in order for them to count toward this degree. Ling 507
(Seminar) and Ling 510 (Selected Topics) will count for credit in a particular curriculumcomponent 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 levelof proficiency in a non-native language. For non-native speakers of English, proficiency in English as described above fulfills this requirement. For natives peakers 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 had two 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 for Life in Extreme Environments (CLEE) is housed at Portland State University and includes faculty members and students who study organisms fromsome of the most extreme habitats on Earth. Cooperative programs at Portland State University include the Marine Mammal Stranding Network, Oregon Zoo, Malheur Field Station, Oregon Health Sciences University, Oregon National Primate Research Center, Oregon Museumof Science and Industry (OMSI), and the Oregon Department ofFish 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 program is designed to prepare students for careers in biological res earch, teaching, health sciences, biotechnology, conservation biology and wildlife management, forestry, and other applied fields. It als o 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 thecatalog 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 programofsecondary 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 admission to the University. See Admissions Requirements (p. 8) for more information.

## BIOLOGY B.A./B.S.

## REQUIREMENTS

In addition to satis fying 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 chemistry with laboratory; one term of organic chemistry; Ph 201, Ph 214; and 12 elective credits fromanthropology, chemistry, computerscience, 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 cannotalso be used in the 12 elective credit area, and university studies courses are not accepted toward fulfillment of this requirement.
All biology majors must complete a minimum of 60 credits in biology including three terms of science majors' introductory biology with laboratory. Of the 60 credits required for the major a minimum of 44 credits must be completed in upper-division biology 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 Bi 401 , Bi 404 , Bi 405 , and Bi 406 which are offered with either the A-F or P/NP grading option, and Bi 407 Seminar which is only offered as P/NP. Ofthe 60 credits required in biology, a minimum of 46 credits must be in courses other than $\operatorname{Bi} 401, \mathrm{Bi} 404, \mathrm{Bi} 405, \mathrm{Bi} 406$, 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 majorcredit 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 |  |  |
| :---: | :---: | :---: |
| the Biology major requirements. |  |  |
| 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 331 | Elements of Organic Chemistry I | 4 |
| Ch 334 | Organic Chemistry I | 4 |
| Ph 201 | General Physics | 4 |
| Ph 214 | Lab forPh 201 or Ph 211 or Ph 221 orPh 231 | 1 |
| Mth 251 | Calculus I | 4 |
|  |  |  |
| Mth 252 | Calculus II or | 4 |

(
Ch 222 General Chemistry II
Ch 223 General Chemistry III 4
Ch 227 General Chemistry Laboratory 1
Ch 228 General Chemistry Laboratory 1
Ch 229 General Chemistry Laboratory

Stat 243 Introduction to Probability and Statistics I \&
Stat 244 Introduction to Probability and Statistics II

Additional science/social science
electives: Any combination of courses at the 200+ level that are not part ofthe University Studies Program from the following departments: Anth, Ch, CS, ESM, G, Mth, PHE, Psy, Ph, or Stat. Courses utilized to fill any other general departmental or biology majorrequirement cannotalso be counted in the elective sciences area. University Studies courses taken in any of the listed departments cannotbe applied toward fulfillment of this area.

## Biology Major Requirements

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:Molecular Cell Biology \& Genetics
Bi 212 Principles of Biology:
Development, Evolution \& Ecology
Bi 213 Principles of Biology:
Organisms, Biodiversity \& Conservation
Bi 214 Principles of Biology Lab I 1
Bi 215 Principles of Biology Lab II 1
Bi 216 Principles of Biology Lab III 1
Upper Division Biology Core
Complete a minimum of 44 upper division 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 from the list below:

| Bi 334 | Molecular Biology | 4 |
| :--- | :--- | :--- |
| Bi 336 | Cell Biology | 5 |
| Bi 341 | Introduction to Genetics | 4 |

## Area B: Systems/Organisms

Complete at least one course from the list below:

Bi 320
Introduction to Organismal
Physiology
Bi 330
Bi 380
Bi 386
Bi 387
Introductionto Plant Biology

## Area C: Ecology/Evolution

Both courses must be completed:
Bi 357 General Ecology
Bi 358 Evolution

Requirement 2
Choose a minimum of two courses at the 300 or 400 level with a major laboratory or field component. Bi 386 or Bi 387 will satis fy 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
Bi $328 \quad \begin{aligned} & \text { Comparative Vertebrate } \\ & \end{aligned}$
Bi 337 Cell Biology Laboratory 1
Bi 361 Introductionto Marine Biology 1
Bi 386 Invertebrate Zoology 6
Bi 387 Vertebrate Zoology 6
Bi $388 \quad$ 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 NaturalHistory of Antarctica 5
Bi 431 Advanced Molecular and Cell 2
Bi 432 Plant Diversity and Evolution 5
Bi $435 \quad$ Plant Systematics 4
Bi 441 Plant Physiology 5
Bi $450 \quad 4$
Bi $455 \quad 6$
Bi $471 \quad 4$
Bi 472 NaturalHistory 3
Bi 473 Field Sampling 4
Bi $476 \quad$ PopulationEcology

## Requirement 3

Choose a minimum of 12 credits from courses with the Bi prefix numbered between 412-499 (can include cours es 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 ofsciencemajors' 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:Molecular Cell Biology \& Genetics
Bi 212 Principles of Biology:
Development, Evolution \& Ecology
Bi 213 Principles of Biology:
Organisms, Biodiversity \& Conservation
Bi $214 \quad$ Principles of Biology Lab I 1
Bi 215 Principles of Biology Lab II 1
Bi 216 Principles of Biology Lab III
Upper-division credits to include at least one course from each of the following three areas:

| Area A: Cellular/Molecular |  |  |
| :---: | :--- | :--- |
| Bi 334 | MolecularBiology | 4 |
| Bi 336 | Cell Biology | 5 |
| Bi 341 | Introductionto Genetics | 4 |

Area B: Systems/Organisms
Bi $320 \quad$ Introduction to Organismal
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)

| Bi 462 | Neuroscience I: Physiology of synapses and circuits or |
| :---: | :---: |
| Psy 200 | Psychology as a Natural Science or |
| Psy 451 | Introductionto |
|  | Neurophysiological Psychology |
| Area B: Sensory/Motor Systems (4 credits) |  |
| Bi 463 | Neuroscience II: Sensory and |
|  | Motor Systems |
|  | or |
| Psy 347 | Perception |
|  | or |
| SpHr 461 | Neurology of Speech and |
|  | Hearing |
| Area C: Research/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 | Languageand Mind | 4 |
| Ling 433 | Psycholinguistics | 4 |
| Ling 445 | Linguistics and Cognitive Science | 4 |
| PHE 466 | Mind/Body Health: Disease Prevention | 4 |
| PHE 467 | Mind/Body Health: Human Potential | 4 |
| PHE 473 | Physiology of Exercise | 4 |
| Phl 432 | Philosophy of Mind | 4 |
| Phl 471 | Topics in Philosophy ofScience: Cognitive Science | 4 |
| Phl 471 | Topics in Philosophy ofScience: Psychiatry | 4 |
| Psy 346 | Learning | 4 |
| Psy 348 | Cognition | 4 |



| PHE 467 | Mind/Body Health: Human Potential | 4 |
| :---: | :---: | :---: |
| PHE 473 | Physiology of Exercise | 4 |
| Phl 432 | Philosophy of Mind | 4 |
| Phl 471 | Topics in Philosophy ofScience: Cognitive Science | 4 |
| Phl 471 | Topics in Philosophy ofScience: Psychiatry | 4 |
| SpHr 471 | Neurolinguistics | 4 |
| SpHr 495 | Neurogenic Communication Disorders | 4 |
| Track 3: All Other Majors (16 credits) |  |  |
| Bi 207 | Biology for Allied Health I | 4 |
| Bi 211 | or Principles of Biology: Molecular Cell Biology \& Genetics And | 4 |
| Bi 214 | Principles of Biology Lab I | 1 |
| Bi 208 | Biology for Allied Health: Evolution and Diversity ofLife | 4 |
|  | or |  |
| Bi 212 | Principles of Biology: | 4 |
|  | Development, Evolution \& |  |
|  | Ecology |  |
|  | 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: | 4 |
|  | Organisms, Biodiversity \& |  |
|  | Conservation |  |
|  | 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 | DevelopmentalBiology | 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 |
| Ph1471 | Topics in Philosophy ofScience: Cognitive Science | 4 |
| Phl 471 | Topics in Philosophy ofScience: Psychiatry | 4 |
| Psy 346 | Learning | 4 |
| Psy 348 | Cognition | 4 |
| Psy 399 | Neuroscience andBehavior | 4 |
| Psy 410 | Cognitive Neuroscience | 4 |
| Psy 410 | Neuroscience Outreach:The Brain in Real Life | 4 |
| Psy 434 | Introductionto Psychopathology | 4 |
| Psy 450 | Psychopharmacology | 4 |
| Psy 452 | Advanced Neurophysiological Psychology | 4 |
| SpHr 471 | Neurolinguistics | 4 |
| SpHr 495 | Neurogenic Communication Disorders | 4 |
| SW 441 | Psychobiology for Social Workers | 3 |

Total Credit Hours: 28
SECONDARY EDUCATION

## Adviser: Dr. Sarah Eppley

Students who wish to teach biology in secondary schools should completeone 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 fordifferentiated grades, except for those offered forpass/no pass only. Students must have at least a 3.00 GPA 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 o review the Master's of Education with science endorsement programas it may be a better fit for your career aspirations and is more widely accepted for employment in secondary education in Oregon. For more information on the Master in Education (M.Ed.) program for secondary educators please see:
https://www.pdx.edu/ci/gtep

## REQUIREMENTS

## Biology majors

Students must complete a biology major's program as outlined above, and include an upper-division course each in microbiology, ecology, genetics, cell biology, and evolution. (See adviser.)

| Non Biology majors |  |  |
| :--- | :--- | ---: |
|  | One year-long sequence in <br> introductory biology | $12-$ |
| Bi 234 | Elementary Microbiology | 15 |
| Bi 235 | Microbiology Laboratory | 4 |
|  | Two upper-division courses in | 2 |
|  | anatomy and/or physiology | 8 |
| Bi 341 | Introductionto Genetics | 4 |
| Bi 357 | General Ecology |  |
| Bi 358 | Evolution | 4 |
|  | Upper-division biology elective | 4 |
|  | in botany or field oriented course | 4 |
|  | 4 |  |
|  | Physical scienceelectives as | 18 |
|  | approved byadviser |  |

Subtotal: 64-67

## Graduate programs

The Department of Biology offers graduate degrees leading to the Master of Arts orMaster of Science, and the Master of Arts in Teaching or Master in Teaching Science/ Biology. The department also 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 admis sion to the graduate program(p.41), 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 prospectivestudent 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 adv isers, research space, and departmental res ources.

BIOLOGY M.A./M.S.
See University master's degree requirements (p.51).
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 admis sion 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 Thes is. No more than a total of 12 credits may be in Bi 501 and Bi 505 Reading and Conference. No more than a totalof9 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 thesis 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 admission to the program. At least 9 credits, butno more than 15 credits, must be in education courses and mustinclude Ed 520 Introduction to Education and Society. The 45 credits required must include 6 credits in either Bi 501 Project Track: Research Projectrelating 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 outreach experienceas 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 oral examination.

## 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 musttake at least 15 credits of adviser-approved graduate-levelwork dis tributed 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.146) for the required education courses.

## BIOLOGY PH.D.

Prospective Ph.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 admis sion 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 afterentering 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 oforiginal research, and presentation of results in a public oral defense and production of formal dissertation 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 ofBlack 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 DepartmentofBlack Studies is devoted to the exploration 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 forthe 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 ofBlack 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 politicaleconomy into its curriculumand its courses.

The programprovides students with a general historical background ofthe 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 DepartmentofBlack Studies are strongly encouraged to enroll in BST 202: Introductionto Black Studies or any other 200-level course. Students should meet with the undergraduate advisor forassistance with course selection based on their interests. Forstudents who plan to apply to graduate school, it is important that they meet with one of their profes sors, the undergraduate advis or, or the department chair during their junioryear, 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

Admission to the department is based on general admission to the Univers ity. See Admissions 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. orB.S., candidates enrolled in the Black Studies major must meet the 60credit minimum. Courses takenunder the undifferentiated grading option (pass/no pass) are notacceptable toward fulfilling the major requirements in the area of specialization. At least 30 of the total 60 credits required for the majoror 45 of the total credits presented for
graduation must be taken in res idence 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 assistance with Black Studies course selection.

## Core courses

| BSt 202 | Introductionto Black Studies | 4 |
| :---: | :---: | :---: |
| BSt 396 | Research Methodologies in Black Studies | 4 |
| BSt 407 | Seminar | 4 |
|  | And Either |  |
| BSt 411 | African American History | 4 |
|  | Seminar |  |
|  | or |  |
| BSt 450 | Topics in African/Caribbean | 4 |
|  | History And Culture |  |
| Elective Courses |  |  |
| BSt | Two lower-division Black | 8 |
|  | Studies courses |  |
| BSt | Six upper-division electives in | 24 |
|  | Black Studies |  |
|  | Three upper-divisionnon-Black | 12 |
|  | Studies courses oradvisorapproved 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 upper division, and eight upper-division advisor-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 cours es chosen from: (8) |  |  |
| :---: | :---: | :---: |
| BSt 202 | Introduction to Black Studies | 4 |
| BSt 203 | African American History I- | 4 |
|  | Slavery to the Harlem |  |
|  | Renaissance |  |
| BSt 204 | African American His tory II - | 4 |
|  | From the Depression Era 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 must complete 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 assistance 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 present experiences 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 cultural activities and the stimulation of an exciting and enlightening intellectual atmosphere in the Portland community, contributing to greater understanding and cooperation between people of various racial and ethnic backgrounds. TheBlackBag 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 small knowledge of atoms and molecules, it is possible to have a cons iderable understanding of many chemical phenomena we see and use. A comprehensive knowledge of chemistry is essential for the person who wishes to help solve the problems of today-problems of illness and disease, problems of wise use of our resources - and for the person who wants to dobasic research in chemistry or who wants to work in the chemicalindustry.
The Department ofChemistry is committed to maintaining a teaching programofexcellence at the undergraduate level as well as having a graduate programemphasizing cutting-edge research in the chemistry of the environment, novel materials and biological systems. Courses tailored for the studentdesiring 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 orhealth-related occupations.
The curriculum, faculty, library, and facilities of the department are approved by the American Chemical Society. Graduating chemistry 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 Univers ity. See Admissions Requirements (p. 8) for more information.

CHEMISTRY B.A./B.S.

## REQUIREMENTS

A student majoring in chemistry is required to take a minimum of 70 credits in the subjectand will take courses in the core areas of general chemistry, analytical chemistry, organic chemis try, physical chemis try, inorganic chemistry, 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 degree requirements, the major in chemistry 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 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 426 | Instrumental Analysis | 4 |
| Ch 427 | Instrumental Analysis | 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 | 2 |
|  | Modeling in Chemistry |  |
| Ch 444 | Physical Chemistry Laboratory | 2 |
| Ch 4XX | Two approved 400-level chemistry courses | 6-8 |
|  | One year of 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 |

## Option I: Chemistry

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
Quantitative Analysis Laboratory

Ch 335 Organic Chemistry II 4
Ch 336 Organic Chemistry III 4
Ch 337 Organic Chemistry Laboratory I 2
Organic Chemistry Laboratory II
Instrumental Analysis 4
Instrumental Analysis 4
Laboratory
Ch 411 Advanced Inorganic Chemistry I 4
Ch 440 PhysicalChemistry I 4
Chysical Chemistry II 4
Ch 443 Numerical Data Analysis and 2

Ch $444 \quad$ Physical Chemistry Laboratory 2

One year of physics with 15
calculus with laboratory Calculus through Mth 253 or 12
equivalent
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
Quant Chen Laboratory
Ch 321 Quantitative Analysis Laboratory 2
Ch $334 \quad 4$
Ch 335 Organic Chemistry II 4
Ch 336 Organic Chemistry III 4

| Ch 337 | Organic Chemistry Laboratory I | 2 |
| :---: | :---: | :---: |
| Ch 339 | Organic Chemis try Laboratory II (chemmajors) | 3 |
| Ch 440 | PhysicalChemistry I |  |
| Ch 441 | PhysicalChemistry II |  |
| Ch 426 | Instrumental Analysis |  |
| Ch 427 | Instrumental Analysis Laboratory | 4 |
| Ch 490 | Biochemistry: Structure and Function | 4 |
| Ch 491 | Biochemistry:Enzymology and Metabolism | 4 |
| Ch 492 | Biochemistry: Nucleic Acids and Biological Information Flow | 4 |
| Ch 493 | Biochemistry Laboratory Two approved 400-level science electives 6-8 | 3 $6-8$ |
|  | Calculus through Mth 253 or equivalent | 12 |
|  | One year ofphysics with calculus with laboratory | 15 |
| Bi 211 | Principles of Biology: Molecular Cell Biology \& Genetics | 4 |
| Bi 212 | Principles of Biology: | 4 |
|  | Development, Evolution \& Ecology |  |
| Bi 213 | Principles of Biology: | 4 |
|  | Organisms, Biodiversity \& |  |
|  | Conservation |  |
| Bi 214 | Principles of Biology Lab I |  |
| Bi 215 | Principles of Biology Lab II |  |
| Bi 216 | Principles of Biology Lab III | 1 |

Ch 490 requires the Ch 334, Ch 335, Ch 336 Organic Chemistry sequence as a prerequisite.

All courses used to satis fy the departmental major requirements, whether taken in the department or els ewhere, 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 o completes 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 411 and CH 490 can also be used to satisfy the Approved 400-level Chemis try elective requirement.
The Department ofChemistry has an approved thesisbased Honors Degree program. Interested students should
consult the Chemistry website and meet with the departmental Honors advis er for details.

## CHEMISTRY MINOR

## REQUIREMENTS

To earn a minor in chemistry a studentmust complete the courses outlined below; at least 10 credits of these must be taken in residenceat PSU.

## Courses

Ch 221
Ch 222
General Chemistry I
Ch 223 Geral Chemistry III
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 Quantitative Analysis Laboratory 2

## One of the following groups:

Group 1:
Ch 334
Organic Chemistry I
Ch $335 \quad$ Organic Chemistry II 4
Ch $336 \quad$ Organic Chemistry III 4
Ch $337 \quad$ Organic Chemistry Laboratory I 2
Ch 338 Organic Chemistry Laboratory II 2 (nonmajors)
Group 2:
Ch 327 Elements of Organic Chemistry 2
Ch 328
Elements of Organic Chemistry 2
Laboratories II
Ch 331 Elements of Organic Chemistry I 4
Ch 332 Elements of Organic Chemistry 4
II
And one of the following:

| Ch 440 | PhysicalChemistry I | 4 |
| :--- | :--- | :--- |
| Ch 350 | Biochemistry | 4 |
| 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 chemis try at thehigh school level should completea 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
Ch 334
Organic Chemistry I
Ch $335 \quad$ Organic Chemistry II
Ch 336 Organic Chemistry III
Ch 337 Organic Chemistry Laboratory I
Ch 338 Organic Chemistry Laboratory II (nonmajors)

Ch 327 Elements of Organic Chemistry Laboratories I
Ch 328 Elements of Organic Chemistry Laboratories II
Ch 331 Elements of Organic Chemistry I
Ch 332 Elements of Organic Chemistry II

## One of the following:

| Ch 440 | PhysicalChemistry I |
| :--- | :--- |
| Ch 350 | Biochemistry |
| Ch 490 | Biochemistry: Structure and |
|  | Function |

Also required:
Ph 201
General Physics
Ph 202 General Physics
Ph 203 General Physics
or
Ph 211 General Physics (with Calculus)
I
Ph 212 General Physics (with Calculus) II
Ph 213 General Physics (with Calculus) III
And
Ph 214

Ph 215 221 or Ph 231
Lab for Ph 202 or Ph 212 or Ph
222 or Ph 232
Ph 216

Ph 214
Lab for Ph 203 or Ph 213 or Ph 223 or Ph 233
or

P 215
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: 52-60
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 admission to the fifthyear teacher-education programwill depend on at least a C- in all chemistry and physics courses, as well as a combined 2.25 GPA for these courses.

## Graduate programs

The Department ofChemistry 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. program is designed for the student who wishes to pursuea 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 providescientific 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 thePh.D. in Chemis try combines original research with advanced cours ework in various disciplines of chemistry. Research foci in the department are biologicalchemistry, materials chemistry, and environmental chemistry. Students that complete the programare prepared to pursue careers in academic, industrial, or government research.

## ADMISSION REQUIREMENTS

Admission to the department is based on general admission to the Univers ity. See the Graduate Programs page (https://www.pdx.edu/chemistry/graduate-programs) on
the Department's website for admissions requirements, programinformation, and application instructions.

## CHEMISTRY M.A.

Designed for the student who wishes to obtain an advanced 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 fromsubstantive 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 COMPLETE (ON THEIR OWN TIMELINE):

- A total of 45 graduate-level credits (foreign languages classes don't count for this cannot be applied to this requirement)
- 36 credits of substantive coursework (graduate level: $510+$ ) - up to 8 credits of which may be "approved" graduate-level clas ses outside Chemistry (e.g. Physics, Biology, SystemScience)
- Department seminar (CH507) - offered each FWS term, enrollment required in all FWS terms in which the student is in the program.
- Complete a $10+$ page written report-give to the Chair of the Graduate Admissions and Advising Committee (GAAC) 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:

- 9 grad-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 project resulting in an original contribution to chemicalknowledge). Candidates must complete a minimum of 45 approved graduatecredits courses.

All students undertake a series ofentrance examinations at the beginning of the program. These exams cover five areas of chemistry: organic, inorganic, analytical, physical, and biochemistry and exams in any three areas must be passed by theend of the first three academic terms of residence.

24 credits of formal graduate instruction mustbe chosen from substantive classes at the graduatelevel (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 completea one termScientific Communication course.

Each candidate for the MS degree in chemistry must complete a research project culminating in the preparation and defenseofa thesis. Further details of all requirements are outlined in the Department of Chemistry's Graduate StudentHandbook.

## STUDENTS NEED TO COMPLETE (ON THEIR OWN TIMELINE):

- A minimum of45 graduate-level credits
- 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 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 ofCH 503: Thesis


## 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 oral examination.

## CHEMISTRY PH.D.

The PhD in Chemistry consists of a combination of cours ework, research, and dissertation (an experimental or theoretical research project resulting in an original contribution to chemicalknowledge). Candidates must complete a minimum of 81 approved graduatecredits courses.

All students undertake a series of entrance examinations at the beginning of the program. These exams cover five areas of chemistry: organic, inorganic, analytical, physical, and biochemistry and exams in any three areas must be passed by theend of the first three academic terms of residence.

24 credits of formal graduate instruction mustbe 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 Ph.D. degree in chemistry must complete the comprehensive examination, a prospectus examination and an originalprogramofresearch. 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 dissertation. Further details of all requirements are outlined in the Department of Chemistry's Graduate StudentHandbook.

## STUDENTS NEED TO COMPLETE (ON THEIR OWN TIMELINE):

- A minimum of81 graduate-level credits
- 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 ofCH603: Dissertation


## Chicano/Latino Studies

150 Parkmill (PKM)
503-725-8499
www.pdx.edu/chicano-latino-studies/

- Minor in Chicano/Latino Studies
- Certificate in Chicano/Latino Studies

Chicano/Latino studies is the interdisciplinary study of social, cultural, political, economic, and historical forces that have shaped the development of the people of Mexico and other Latin American countries in the United States over the past 300 years. Emphas is is on the experience of the Chicano and other Latinos as residents and citizens in the United States and not in their countries of origin or descent.

The Chicano/Latino experience predates fromthe mid-19th century when territories belonging to Mexico were occupied by the United States. Latinos living in the United States have, over the years, developed a rich and extensive literature. They have been involved in all aspects of American life and have made major contributions in all areas of society.

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 important ins ight 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 to enter 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' undergraduatedegrees, go to www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Admission to the programis based on generaladmis sion to the University. See Admissions Requirements (p.8) for more information.

CHICANO/LATINO STUDIES MINOR

## REQUIREMENTS

In addition to meeting the general PSU 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 (16 credits) |  |  |
| :---: | :---: | :---: |
| ChLa 201 | Introductionto Chicano/Latino | 4 |
| ChLa 301U | Chicano/Latino Communities | 4 |
| ChLa 302U | Survey ofChicano/Latino | 4 |
|  | Literature |  |
| ChLa 303U | Chicana/Latina Experience | 4 |
| Upper Division Electives (12 credits) |  |  |
| One 400-level course and two others fromthe following: |  |  |
| ChLa | Mexican American/Chicano | 4 |
| 325/Hst 325 | History I, 1492-1900 |  |
| ChLa | Mexican American/Chicano | 4 |
| $\begin{aligned} & 326 \mathrm{U} / \mathrm{Hst} \\ & 326 \mathrm{U} \end{aligned}$ | History II, 1900-Present |  |
| ChLa 330U | Latino Popular Culture | 4 |
| ChLa 331U | Barrio Culture: Art and | 4 |
|  | Literature |  |
| ChLa 335 | Chicano/Latin American Film | 4 |
| ChLa 340 | Mayas, Aztecs, and Chicanos | 4 |
| ChLa 375 U | SouthwesternBorderlands | 4 |
| ChLa 380U | Latinos in the Economy and | 4 |
| ChLa 390U | Latinos in the Pacific Northwest | 4 |
| ChLa 399 | Special Studies | -8 |
| ChLa 405 | Reading and Conference | 1-8 |
| ChLa 407 | Seminar | 1-8 |
| ChLa 408 | Workshop | 1-8 |
| ChLa 410 | Selected Topics | -8 |
| ChLa 411 | Chicano/Latino History 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, distributed as follows:

| Core courses: (16 credits) |  |  |
| :---: | :---: | :---: |
| ChLa 201 | Introduction to Chicano/Latino | 4 |
|  | Studies |  |
| ChLa 301U | Chicano/Latino Communities | 4 |
| ChLa 302U | Survey of Chicano/Latino | 4 |
|  | Literature |  |
| ChLa 303U | Chicana/Latina Experience | 4 |
| Spanish Language Proficiency (8 credits) |  |  |
| Span 301 | Third-year Spanish | 4 |
| Span 302 | Third-year Spanish | 4 |

Upper-division electives from the following: ( $\mathbf{1 2}$ 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 |  | 4 |
| ChLa 330U | Latino Popular Culture | 4 |
| ChLa 331U | Barrio Culture: Art and |  |
|  | Literature | 4 |
| ChLa 335 | Chicano/Latin American Film | 4 |
| ChLa 340 | Mayas, Aztecs, and Chicanos | 4 |
| ChLa 360 | Bilingualism in U.S. Latinx | 4 |
|  | Communities | 4 |
| ChLa 375U | SouthwesternBorderlands | 4 |
| ChLa 380U | Latinos in the Economy and | 4 |
|  | Politics |  |
| ChLa 390U | Latinos in the Pacific Northwest | 4 |
| ChLa 399 | SpecialStudies | 8 |
| ChLa 405 | Reading and Conference | 4 |
| ChLa 407 | Seminar | 4 |
| ChLa 408 | Workshop | 4 |
| ChLa 410 | Selected Studies | 8 |
| ChLa 411 | Chicano/LatinoHistory Seminar | 4 |
| ChLa 414 | Chicano/LatinoLiterature | 4 |
| ChLa 450U | Latinos in Education | 4 |
| Subtotal: 36 |  |  |

## Communication

Univers ity 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 ofthe complexity and
dynamic nature of the communication process, as well as a senseof 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

Admission to the department is based on general admission to the University. See Admissions 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 classes gradedC 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 general University requirements, the student must complete a minimum of 60 credits in communication courses plus Wr 222 or Wr 323 for a total of 64 credits.

## Courses

Comm 300 Principles ofCommunication 4
Comm 311 Research Methods in 4
Communication
Comm 316 Communication, Individuals, and Discourse
Comm 326 Communication, Society, and
Culture
Communication electives

Wr 222 Writing Research Papers
Wr323 Writing as Critical Inquiry
Of the 44 credits of communication electives,

- At least 32 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 8 credits may be counted toward the major from courses numbered Comm 401 through Comm 409, including Communication Internship.


## Total Credit Hours: 64

## 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 adv is 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 ofC is required for courses to be counted toward the minor. Advisor-approved film cours es 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 theBA/BS and MS in Communication. Students can completeboth 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 for students who want to focus on communication research in their careers and for those interested in doctoralstudies. The Professional Track is designed for students who prefer to focus on applying their
studies to their careers in communication. We especially encouragemid-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 social interaction.

## 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.41) for information and deadlines).

For admis sion 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 cours ework and/or directed readings. All such work is separate fromwork toward the master's degree.

## Application process

Prospectivestudents 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; Officialtranscripts; 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). Decis ions about admission, 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 ofGraduate 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 have2 outs tanding incomplete grades are required to complete their cours ework in good stan ding 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 thesis. Professional Trackstudents may complete either a thesis or the project (exam) with the approval of 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 cours es:

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
Communication Research
Comm 531 Qualitative Methods in
Communication Research
4

## Total requiredcore course credits :

Subtotal: 12
Minimum elective course credits:
Subtotal: 28
Minimum Thesis or Project credits:

Students are encouraged to choose electives from within the Department, and courses taken outside the Department must be approved by the student's programadvisor in order to count toward the requirements of the degree.
Every student is encouraged to take onecredit 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 Thes is or Project, bringing the total number of credits to 46 .
Subtotal: 46

## PROGRAM OPTIONS

All students complete oneof the following with close supervision of their advis or. We strongly encourage students to pursuethe thesis option.

## a. Thesis

The thes is entails a systematic study of a significant problemand contributes to the body of knowledgerelevant to the study. A thesis is a research report completed in close consultation with the student's academic adv is or 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 adv isor on planning a course of study grounded in relevant theories, concepts and practices. Allstudents who choose this option must demonstrate appropriateres earch and methodological competency by successfully completing 3 exams as the culminating project. Students must completeat least 6 project credits (Comm 506).

## Conflict Resolution

Smith Memorial Student 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 Resolution (GCCR-GCAP)
The Bachelors of Arts/Sciences, the Minor and Master of Arts/Sciences degree programs in conflict resolution are trans-disciplinary, encompassing the practical and theoretical bases of mediation and negotiation, involving research, theory, and competency-based education to help build conditions necessary for positive peace, conflict transformation (fromdestructive to constructive), and univers al respect 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 deescalate destructiveconflicts thatarise 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 transformation strategies to bear. Master's degree holders are prepared for leadership positions in conflict managementand 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. Theygo on to focus on trans formation 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 go on to focus on perspectives, strategies and processes at the organizational level of peace building and conflict transformation.
Courses in conflict resolution 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 admission 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 20 credits of required classes and 36 credits of CR electives. Eight (8) credits must be taken at the 400level. The learning outcomes prepare the CR major degree holderequally for graduate school and employment in 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 $i t$ to apply toward a CR degree.

| CR 301U | Introduction to Conflict <br> Resolution | 4 |
| :--- | :--- | :--- |
| CR 307 | Conflict ManagementSkills | 4 |
| CR 310U | Conflict Resolution Values \& | 4 |
|  | Ethics |  |
| CR 311U | Conflict Resolution Psychology | 4 |
| CR 312 | Intercultural Conflict Resolution | 4 |

Subtotal: 20

## Electives

CR 302U
Peace Studies
CR 303U
Consensus Building
CR 304U Participating in Democracy
CR 305U Ecology of War and Peace
CR 306U Nonviolence: History and
Campaign Design
CR 314 Introduction to Restorative Justice
CR 411 Conflict ResolutionCareer
Preparation
CR 416 Evil and Hate
CR 419 Forgiveness and Atonement 4
CR 420 Individual and Group
CR 423 Dialogue Across Differences
CR 428 Human Values in War and
Peace: Value Dilemmas, Contradictions and Res olutions
CR 429
European Union as a
CR 439 Family Mediation
CR 440 PeerMediation 2
CR 441 Storytelling and Conflict
CR 442 Peace Education

| CR 443 | Nationalismand Democracy in a <br> Post-9/11 World | 4 |
| :--- | :--- | :--- |
| CR 444 | Neighbors and Enemies: Cyprus, <br> Greece and Turkey | 4 |

Subtotal: 36
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 minor are 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 |  |
|  | Campaign Design |  |
| CR 307 | Conflict Management Skills | 4 |

The Minor is a degree program that 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 Trans formative 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 | NonviolentInteraction | 2 |
| CR 201 | Social Movement Messaging | 2 |

Subtotal: 4

| Elective Courses |  |  |
| :--- | :--- | :--- |
| Comm 220  <br> Comm Public Speaking <br> 314U Persuasion | 4 |  |
| Comm 319 | Social Media | 4 |
| CR 303U | Consensus Building | 4 |
| CR 306U | Nonviolence: History and | 4 |
|  | Campaign Design |  |
| Eng 490 | Advanced Topics in Rhetoric | 4 |
| Psy 343 | Social Psychology: Social <br> Relationships and Groups | 4 |
| Psy 426 | Psychology of Stigma \& Social | 4 |
|  | Inequality <br> Wr 228 | Media Writing |

Subtotal: 12

## Total Credit Hours: 16

## Graduate program

## ADMISSION REQUIREMENTS

For admission 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 program is broadly interdisciplinary, students with any undergraduate degree are encouraged to apply for admis sion. 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. All such work is separate from work toward the master's degree.
Each applicant to the conflict resolution graduate program must submit a statementof 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. Regularstatus and retention in the graduate program requires the satisfactory completion of 12 graduate credits with a minimum grade of 3.00 in each course and evidence of satis factory progress toward the degree.
Students entering th is 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 their own 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 about how identity issues, 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 programofstudy to the $\mathrm{H}-$ 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 <br> Prevention Synthesis | 4 |
|  | Constructions of Power and <br> Knowledge: Gender, Race, and <br> Nations | 4 |

Subtotal: 12

## ELECTIVES

A student will take a minimum of 8 credits offered below:

| BSt 514 | Racism | 4 |
| :--- | :--- | :--- |
| BSt 550 | Topics in African/Caribbean | 4 |
|  | History and Culture |  |
| CR 527 | Nationalismand Ethnic Conflict | 4 |
| Hst 510/Jst | The Holocaust | 4 |
| 510 |  | 4 |
| GRN 520 | Critical and Decolonizing | 4 |
|  | Research Methodologies |  |
| GRN 530 | Social Justice Pedagogy | 4 |
| GRN 550 | Seminar in Gender, Race, and <br>  <br> PS 510 | 4 |
| Wations | 4 |  |
| Wenocide |  | 4 |
|  | Transnational Feminisms | 4 |

## Total Credit Hours: 20

All courses must be 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 studentseeking 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 analysis 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 Credit Hours: 22

## CONFLICT RESOLUTION M.A./M.S.

Students in this programwill study the theoretical, conceptual, and methodological dimens ions 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 <br> Resolution | 4 |
| :--- | :--- | ---: |
| CR 513 | Advanced Values and Ethics in <br> Conflict Resolution | 4 |
| CR 518 | Psychology of Peace and <br> Conflict | 4 |
| CR 526 | Advanced Intercultural Conflict <br> Resolution | 4 |
| CR 508 | Workshop <br> CR 511 | Research Methods in Conflict <br> Resolution |
| CR 509 | Practicum <br> CR 522 | Thesis and Project Preparation |
|  | Seminar | 4 |
| Ser | 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 adv iser. Guidelines for the project proposal are available from the programoffice. Once approved by the advis er and committee, a signed copy of the proposal is filed with the programoffice. Projects typically 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 froma programplanned in consultation with the student's adviser. Guidelines for the thesis proposal are available fromthe program. Once accepted and approved by the adviser and thesis committee, a signed copy of the proposal is filed with the programoffice. Upon completion of the thesis, each studentmust defend it in an oral examination 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 defense and 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 thes is 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 FariborzMaseeh Hall (FMH)
503-725-3521
www.pdx.edu/english/

- B.A., B.S. 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 Technical Writing
- M.A., M.S. in Book Publishing


## Undergraduate programs

The study of English has long been considered one of the best ways to obtain a liberal education. Courses are designed to develop students' critical capabilities, to deepen their understanding of diverse cultural 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 them for graduate work leading to professions in fields such as law, public policy, administration, and bus iness. 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 Univers ity. See Admissions 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 indispensable forhigher-level work in English.

Students must take both Eng 300 and Wr 301.
Eng 300 is a prerequis ite 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: (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 culturalmoments.

Take two cours es 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
351U/BSt
351 U
Eng 360U
American Literature and Culture

Eng 416
History of Rhetoric
Eng 426 Advanced Topics in Medieval
Literature
Eng 441 Advanced Topics in Renaissance

Literature

| Eng 450 | Advanced Topics in Eighteenth- <br> Eentury Literature | 4 |
| :--- | :--- | :--- |
| Eng 458 | Advanced Topics in <br> Eng 46manticism | 4 |
| Eng 491 | Advanced Topics in American | 4 | | Literature to 1800 |
| :--- |
| History of Literary Criticism and |
| Theory I |$\quad 4.4$.

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 <br> Globalization |
| :--- | :--- | :--- |
| Eng 428 | Canons and Canonicity | 4 |

Subtotal: 4

## IV. Electives: (40 credits)

These courses provide students with the opportunity to pursue theirown interests and design a purposeful course of study.
Take ten Eng or Wr courses. At least seven courses (28 credits) must be at the 300 or 400 level. Three ENG courses ( 12 credits) may be at the 200-level; 200-level WR cours es do not apply to the English major. Please read the "Notes and restrictions" section below for more information.

Subtotal: 40

## Total Credit Hours: 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 -level 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/or Writing 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 Englishmajor.
- 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 Wr323 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.

## ADMISSION REQUIREMENTS

Admis sion to the degree programis based on (a) general admiss ion to the university (see University Admis sions (p. 8) for more information) and (b) admis sion to theCreative Writing program, which includes submission of a Statement of Purpose and a writing sample (10-15 pages of poetry or 15-25 pages of prose).

## 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 ( $\mathbf{8}$ 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 themto find connections between multiple topics and culturalmoments.

Take two courses from the following list.

| Eng 301U | Topics in Shakespearean Genre |
| :--- | :--- |
| Eng 320U | The English Novel I |
| Eng 340U | Medieval Literature |
| Eng 341U | Renaissance Literature |
| Eng 342U | Eighteenth Century Literature |
| Eng 343U | Romanticism |
| Eng | African American Literature I |
| 351U/BSt |  |
| 351U |  |
| Eng 360U | American Literature and Culture |
|  | I |
| Eng 416 | History ofRhetoric <br> Eng 426 <br>  <br> Advanced Topics in Medieval <br> Literature <br> Advanced Topics in Renaissance |
| Eng 450 | Literature <br> Advanced Topics in Eighteenth- <br> Century Literature |
| Eng 458 | Advanced Topics in <br> Romanticism |
| Eng 460 | Advanced Topics in American <br> Literature to 1800 |
| Eng 491 | History ofLiterary Criticism and <br> Theory I |

## 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 fromthe following list.

$$
\text { Eng } 326
$$

Literature, Community, and Difference
Eng 327 Culture, Imperialism, and Globalization
Eng $428 \quad$ Canons and Canonicity

## Required Writing Cours es ( 12 credits)

Wr 212 Introductory Fiction W riting
Wr 213 Introductory Poetry Writing
Wr 214 Introductory Nonfiction Writing

## Writing Electives (32 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
Wr 413 Advanced Poetry Writing 4
Wr 428 Advanced Media Writing 4
Wr456 Forms of Nonfiction 4
Wr457 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, Wr 407, Wr412, and Wr413 may be repeated for credit.

## Graduation Requirement: The Senior Portfolio

The SeniorPortfolio is submitted forapproval by theend 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 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 mustinclude page numbers, and titles for each piece in your Writing section. Statement of Artistic Intent will address a setof
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 cours es 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.
- W ork will not be judged by its subgenre or subject matter perse, or on its experimental or conventional nature; however, students are expected to carefully analyze and contextualize their artis try 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 English 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 studentreceives a C or 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 CreativeWriting major.
- A minimum of 24 credits in English and/or Writing 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 residenceat PSU).

- Twelve credits must be ENG courses.
- Sixteen credits mustbe 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/or Wr 405.
- With the exception of upper-division 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-division creative writing courses as signed a grade of pass may apply to the minor.
Note: The following courses will notcount 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: Wr 399, Wr 404, Wr 405.
- No more than 8 credits total of courses taken with undifferentiated grading (i.e. Pass/No Pass) may be applied to the Writing minor.
- Any course used to satis fy the minor requirement must have been as signed a grade of Pass (undifferentiated grading) or a grade ofC or higher (differentiated grading).

Note: The following courses will not 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 Research Papers, or Wr 323 Writing as Critical Inquiry.

## FILM STUDIES MINOR

## REQUIREMENTS

The film studies minor is offered through the Departments of English, Communication, and Theater andFilm. 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 W orld Languages and Literatures, Art, History, Black Studies, W omen, 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 orhistory 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.
University Application: Complete the University application.

Departmental Application: Complete the applicationat 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 for pursuing the Certificate in Comics Studies, and what most interests you about comics (creation, writing, editing, drawing, his tory, theory, critical scholarship, etc.).

Copies of transcripts frompreviously-attendeduniversities and/or colleges.

## REQUIREMENTS

Core Requirement
Eng $496 \quad$ Comics Theory
Elective 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 |  |
| Art 356 | Visual Storytelling |  |
| Art 370 | Topics in Printmaking |  |
|  | Techniques |  |
| Art 455 | Time-Based Art Studio | 4 |
| Eng 306U | Topics in Literature and Popular |  |
| Eng 410 | Special Topics in Comics |  |
|  | Studies |  |
| Eng 497 | Comics History |  |
| Jpn 343 | Topics in Japanese Literature (In |  |
| Phl 317U | Philos ophy of Art |  |
| WLL 448U | Major Figures in World |  |
|  | Literature |  |
| Wr 300 | Topics in Composition |  |
| Wr 398 | Topics: Writing Comics |  |
| Wr 400 | Special Topics: Advanced |  |
|  | Writing forComics |  |
| Wr 460 | Introduction to BookPublishing | 4 |
| Wr 462 | BookDesign 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 orhigher (or Pass) for each course.

## SECONDARY EDUCATION ENDORSEMENT (GTEP)

Forstudents who completea major in English and wish to teach Language Arts in middle or high 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 ofB-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 for students 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 humanitiesrelated fields fromhighereducation 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

Applicationdeadline January 15th.

- Applications received after this date may notbe reviewed.
- Applicants will be asked to submit the following through the online application found at http://www.pdx.edu/english/graduate-admis sions:
-A minimum of two letters of academic recommendation
-Statement of purpose of study
-Two recent samples of written work to include an analyticalessay


## -A complete set of transcripts

-GRE (Graduate Record Exam) scores. Verbal and quantitative scores are required; the subject area exam is not required.

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 programwith a knowledge of literary history, excellent writing skills, and experience doing advanced 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 theserequirements may be considered for conditional admission. 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 whose native language is not Englishmustscore 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 University master's degree requirements (p.51).
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 ofpre- 1800 British or American literature, 4 credits in literature orrhetoric, whether Anglophone or in translation, before 1900, and 4 credits of critical theory. The remainder of the student's programmay, with the approval of the adviser, include cours ework 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 essay 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 W riting (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 established writers. In workshop, students engage in close readings and critiques of theirpeer's work, while recent seminars have includedForms, Defamiliarization, Constraint-based Writing, Fragments, and Aspects of Translation.
Prospectivestudents 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 cours ework 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 journalism, 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 cours ework, 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 Require ments

Applicants to the M.F.A programmust provide satisfactory evidence of preparedness to undertake advanced work, which would include a B.A., B.F.A., or B.S. degree froma regionally accredited collegeor university and a 3.25 GPA in undergraduate work. The application deadline is January 15. Applicants mustsubmit 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 intellectual work, 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. Unofficialtranscripts 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 identifying 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 ofbasic 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 oneor multiple bodies of work equal the pagerequirements listed below.

$$
\text { -In poetry: } 12-15 \text { pages }
$$

-In fiction: 20-30 pages
-In nonfiction: 20-30 pages of magazine articles or creative nonfiction

Writing Samples and optional additionalmaterial 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 required for admission to the M.F.A. in Creative Writing program.

## REQUIREMENTS

| Courses |  |  |
| :--- | :--- | ---: |
|  | MFA Core Workshops | 16 |
|  | Wrseminars in Strand | 8 |
|  | Electives | 16 |
| Wr503 | Thesis | 8 |

Subtotal: 48
Core Workshops (4 classes): WR 521, WR 522, 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 four times 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 the student's strand. Fictionseminars 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 (4 classes): Graduate ENG and/or WR courses chosen from within the department. Of these, students are encouraged to take at least one WR 507 seminar outs ide of their genre. Up to 8 credits may be taken in LING 590, TA 574 , or TA 575 or, with adv is 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 als o complete a creative thesis of high literary merit, pass a written examination based on the thesis, 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 Science in Book Publishing. The 48 -credit M.A./M.S. in BookPublishing is designed 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 admis sions which follow the Univers ity'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 mustmeet the April 1 deadline. Book Publishing 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 conditional on the appointee remaining for the entire coming school year.

## Admission Require ments

Admission 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. Applicants do not need to havea previous degree in English or Writing, but must hold a B.A. or B.S. degree from a regionally accredited college or university. Applicants must also submit the following:

- A letterofintroduction.
- A complete set of transcripts. A transcript fromeach post-secondary institution youhave attended is required. Unofficial trans cripts 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 ofrecommendation.
- A writing sample of fifteen to thirty pages of writing that demonstrates your potential as a publishing professional. Previously published work is welcome, and your sample can consist ofmultiple pieces, so long 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; one way 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 totalof 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 cours ework, 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 final paper. 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, res earch and writing on issues in contemporary publishing. Other possibilities are negotiable with the assigned graduate adviser in Book Publishing.

## Core Courses ( 24 credits)

Students choose 6 out of 7 available core courses to satisfy the 24-credit requirement.
Wr 560 Introductionto BookPublishing 4
Wr561 BookEditing 4
Wr562 BookDesign Software 4
Wr563 BookMarketing 4
Wr 564 Business of BookPublishing 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 ofOolig an Press, a small 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 Master of Arts in Writing and the Master of Science in Professional and Technical Writing. The 48-credit M.A./M.S. in Profes sional 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 admis sions which follow the Univers ity's admis sion deadlines as follows: April 1st for Fall admission; Sept. 1st forWinter; andNov. 1st for Spring.

Please note that Graduate Assis tantship applications can only be accepted from fall term applicants, who must meet the April 1 deadline.

## Admission Require ments

Admission to graduatestudy is granted on the basis of evidence ofsuitable preparation and the probability of success in the intended field ofstudy; strong writing skills are cons idered central. Applicants do not need to havea 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 letterofintroduction.
- A complete set of transcripts. A transcript fromeach post-secondary institution you haveattended 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 ofthree 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, orweb 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 required for 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 theadviser.
Students will complete 16 core credits ( 4 courses), 20 technical writing electivecredits ( 5 courses), and 12 credits ( 3 courses) ofopen 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 demonstrating competence at a professional levelor a research-based thesis.

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 Technical Writing will be awarded.

## Core Courses (16 Credits)

4 courses form the foundation of the curriculum. These 4 courses reflect the curriculum's balanced attention to critical academic inquiry and professionalization forwork 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 $531 \quad$ Advanced Topics in Technical 4
Wr $532 \quad$ Frameworks for Technical 4 Writing
Wr 533 Research Methods for Technical 4

Writers

| Technical Writing Electives (20 Credits) |  |  |
| :---: | :---: | :---: |
| Wr 510 | Selected Topics in Writing | 0-6 |
| Wr 524 | Grant Writing for Professional Writers | 4 |
| Wr 526 | Document Design | 4 |
| Wr 527 | TechnicalEditing | 4 |
| Wr 529 | Writing Computer Documentation | 4 |
| Wr 531 | Advanced Topics in Technical Writing Technologies | 4 |
| Wr 560 | Introductionto Book Publishing | 4 |
| Wr 572 | Copyediting | 4 |
| Wr 562 | BookDesign Software | 4 |
| Wr 566 | Digital Skills | 4 |
| Wr 565 | Intellectual Property and Copyright | 4 |
| Eng 513 | Teaching and Tutoring Writing | 4 |
| Eng 514 | Composition Theory | 4 |
| Eng 515 | Research Methods in Rhetoric and Composition | 4 |
| Eng 590 | Advanced Topics in Rhetoric | 4 |
| Eng 516 | History of Rhetoric | 4 |
| Eng 525 | PracticalGrammar | 4 |

## Open Electives (12 Credits)

Students may take any additional 500-level courses in Wr or Eng.
Students may als o use open elective credits to tailor their degree to their interests 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 for 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 relevant graduate coursework outside of the department for open electivecredit with approval from the Director of Professional 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
Wr509 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 Environmental Studies
- Minor in Climate Change Science and Adaptation
- Minor in Environmental Science
- 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 scienceand management is the study of the interactions among society and the physical, chemical, ecological, and biological processes that structure and maintain ecosystems. Our work is critical to understanding and developing sustainable ecosystems, human societies, and economies. Environmental Science and Management at PSU focuses on processes that link terrestrial, urban and aquatic ecosystems, consequences of human alteration of those linkages, and developmentof policies to manage human interaction with the environment. We conduct our research by studying organisms and specific linkages and processes across systems and by studying interactions between organisms, processes, and linkages in a specific ecosystemor waters hed, such as the Columbia River Basin. The Department of Environmental Scienceand Management prepares students to develop the skills and interd is ciplinary understanding to be scholars and managers of human interaction with, and impact on, environmental systems.
The Department of EnvironmentalScience 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 Bus iness

Administration 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 curriculumthat 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 assure propercourse 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

Admission to the department is based on general admission to the Univers ity. See page Admis sions 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 environmental management and policy (Management track).

In addition to satis fying general University requirements ( 45 credits), the Environmental Science and Management degree requires 74-87 core credits plus 30-31 credits in either the Science or Management track.

All courses used to satis fy the Environmental Science major requirements, whether taken 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

| ESM 150 | Orientation to Environmental | 1 |
| :---: | :---: | :---: |
|  | Sciences and Management |  |
| ESM 220 | Introductionto Environmental | 4 |
|  | Systems |  |
| ESM 221 | Applied Environmental Studies: | 4 |
|  | ProblemSolving |  |
| ESM 222 | Applied Environmental Studies: | 4 |
|  | Policy Consideration |  |
| ESM 335 | Introductionto Environmental | 4 |
|  | Management |  |
| ESM 340 | Research Methods in | 4 |
|  | EnvironmentalScience |  |
| ESM 407 | Environmental Seminar | 1 |
| Wr327 | Technical Report Writing | 4 |
|  | 12 credits in 400-level topical area | 12 |
|  | 16 credits of 400 -levelESM courses (excluding ESM 407) | 16 |

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 | 4 |
| ESM 343 | EnvironmentalProblemSolving: <br> Restoring EcosystemDamage <br> from Human Impacts | 4 |

## Biology Core (Option 2)

| 15 credits of the following: |  |  |
| :---: | :---: | :---: |
| Bi 211 | Principles of Biology: Molecular Cell Biology \& Genetics |  |
| Bi 214 | Principles of Biology Lab I |  |
| Bi 212 | Principles of Biology: |  |
|  | Development, Evolution \& |  |
|  | Ecology |  |
| Bi 215 | Principles of Biology Lab II |  |
| Bi 213 | Principles of Biology: |  |
|  | Organisms, Biodiversity \& |  |
|  | Conservation |  |
| Bi 216 | Principles of Biology Lab III |  |
| Chemistry Core (Option 1) |  |  |
| ESM 230 | Fundamentals of Environmental Chemistry I |  |
| ESM 231 | Fundamentals of Environmental Chemistry II | 4 |

## Chemistry Core (Option 2)

| Ch 221 | General Chemistry I | 4 |
| :--- | :--- | :--- |
| Ch 227 | General Chemistry Laboratory | 1 |
| Ch 222 | General Chemistry II | 4 |
| Ch 228 | General Chemistry Laboratory | 1 |

GIS Core (Option 1)

| 4 credits selected fromthe following: |  |  |
| :---: | :--- | :---: |
| G 424 | Geographical Information | 4 |
|  | Systems for the Natural Sciences <br> G 425 | Field GIS |

## GIS Core (Option 2)

| 8 credits of the following: | 4 |  |
| :--- | :--- | :--- |
| Geog 380 U | Maps and Geographic | 4 |
|  | Information |  |
| Geog | Geographic Information Systems | 4 |
| 488/USP | I: Introduction |  |
| 591 |  |  |

Subtotal: 74-87
SCIENCE TRACK


| ESM 334 | Modeling for Environmental Managers | 2 |
| :---: | :---: | :---: |
|  | Methods of Data Collection, |  |
|  | Analysis, Representation, and |  |
|  | Modeling for Environmental |  |
|  | Managers Lab |  |
| ESM 487 | Environmental Justice | 4 |
| Ec 332U | Economics of Environmental | 4 |
|  | Issues |  |
| ESM 435 | NaturalResourcePolicy and | 4 |
|  | Management |  |
| Mth 112 | Introductory College | 4 |
|  | Mathematics II |  |
| Geog 210 | Physical Geography | 4 |
| Subtotal: 30 |  |  |

Total Credit Hours: 104-118

ENVIRONMENTAL STUDIES B.A./B.S.

## REQUIREMENTS

Department of Environmental Science and Management and the Department of Geography are collaborating to offer a degree in Environmental Studies. The degree prepares the students for more sophisticated upper division courses at the interface between science and policy by requiring themto take some foundational courses in natural sciences, geography, and environmentalpolicy.
A summary of the requirements are listed below:

- 28 credits in the EnvironmentalStudies Core
- 24-26 credits in Foundation courses including the subjects of biology, chemistry, and geography
- 22 credits froma list of "Skills" that includes quantitative analysis, visualization of spatial data, field methods, and communication
- 20 credits in EnvironmentalSystems ( 12 credits) and Geography \& Human Systems (8 credits)

There is a minimum of 94 credits required for this major.
Courses taken under the undifferentiated grading option (pass/no pass) will not be accepted toward fulfilling major requirements except for ESM 150 and ESM 407, which are only available as pass/no pass courses. Additional courses may be required as prerequisites. All courses used to satisfy the EnvironmentalStudies major requirements, whethertaken in the department or in otherdepartments, must be graded C-or above.
Environmental Studies Core Courses
ESM 150
Orientation to Environmental
Sciences and Management
ESM 220

Introduction to Environmental Systems

| ESM 221 | Applied Environmental Studies: <br> Problem Solving <br> Applied Environmental Studies: <br> Policy Consideration |
| :--- | :--- |
| ESM 222 | Environmental and Ecological <br> ESM 330 <br> ESM 333Literacy <br> Methods ofData Collection, <br> Analysis, Representation, and <br> Modeling forEnvironmental <br> Managers <br> Methods ofData Collection, |
| ESM 334 | Analysis, Representation, and <br> Modeling forEnvironmental <br> Managers Lab <br> Introductionto Environmental |
| ESM 335 | Management |
| ESM 407 | EnvironmentalSeminar |
|  |  |

Subtotal: 28

## Environmental Studies Foundation Courses

Biology (8-10)
Take one of the following sequences:

Statistics I

Bi 212 Principles of Biology:
Development, Evolution \& Ecology
Bi 215 Principles of Biology Lab II
And
Bi 213 Principles of Biology:
Organisms, Biodiversity \&
Conservation
Bi 216 Principles of Biology Lab III
or
$\begin{array}{ll}\text { Sci 341U } & \begin{array}{l}\text { Biology Concepts and } \\ \text { Applications I }\end{array} \\ \text { Sci 342U } & \begin{array}{l}\text { Biology Concepts and } \\ \text { Applications II }\end{array}\end{array}$
Take all of the following

| ESM 230 | Fundamentals of Environmental <br> Chemistry I | 4 |
| :--- | :--- | ---: |
| ESM 231 | Fundamentals of Environmental | 4 |
| Geog 210 | Chemistry II | Physical Geography |
| Geog 230 | Environment and Society: Global <br> Perspectives | 4 |

Subtotal: 24-26

## Skills

Students must take a total of 22 credits ofskill courses, across four areas, including the following:
Quantitative Analysis (4)
Introduction to Probability and

GIS and Mapping (8)

| Geog 380U | Maps and Geographic | 4 |
| :--- | :--- | ---: |
|  | Information |  |
| Geog | Geographic Information Systems | 4 |
| 488/USP | I: Introduction |  |
| 591 |  |  |

Field Methods (2) ESM 342 Field Methods

Communications (8)
Wr327 Technical Report Writing 4
Comm 410 EnvironmentalCommunication 4
Subtotal: 22
Environmental and Human Systems (20)
Students must take at least 3400-level courses in Environmental Systems and 2400 -level courses in Geography/Human Systems froman approved list of focus areas (http://www.pdx.edu/esm/environmental-studies).

Subtotal: 20
Total Credit Hours: 94-96

## ENVIRONMENTAL SCIENCE/ENVIRONMENTAL STUDIES HONORS TRACK

The Honors Track in Environmental Science or Environmental Studies will allow outs tanding undergraduate students to obtain recognition for exceptional performance in coursework and res earch. Students will gain real life experience that will ass ist them when apply ing 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 streng thens 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 will identify a research project that will include readings, field or lab work, and a thes is. For additional information about the ESM Honors Track, please visit 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 theworld will spend billions of dollars to support adaptation measures that seek to reduce climate-
related vulnerabilities forpeople 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 rigorous certificate that will require a totalof 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.


|  | Subtotal: 8 |  |
| :--- | :--- | :--- |
| Required courses |  |  |
| ESM 335 | Introduction to Environmental <br> Management | 4 |
| ESM 462 | Climate Change Impacts, <br> Adaptations and Responses: <br> Geosphere and Anthrosphere | 4 |
| ESM 464 | Climate Adaptation: Managing <br> Environmental Risks and | 4 |
| ESM 407 | Vulnerabilities <br> Climate Change Adaptation SOE <br> Seminar | 1 |

Subtotal: 13

Students must take required courses for a differentiated grade and earn a C-or better for it to counttoward 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 management requires a consideration of the ecological, social, and policy context ofOregon'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 activeroles in and contribute to management of Oregon's forests.

This is a rigorous certificate that will require eight 400levelcourses. 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 | Natural ResourcePolicy and | 4 |
|  | Management |  |
| ESM 445 | Old-growth Forest Ecology | 4 |
| ESM 465 | Investigating Ecological and | 4 |
|  | Social Issues in Urban Parks and |  |
| Geog 413 | Natural Areas |  |
|  | Disturbance Biogeography of | 4 |
| Geog 415 | Pacific Northwest |  |
| Geog 448 | Soils and Land Use |  |

Subtotal: 16

| Core courses |  |  |
| :--- | :--- | :--- |
| ESM 407 | Forest Ecology and Management | 1 |
|  | Seminar |  |
| ESM | Landscape Ecology | 4 |
| 418/Geog |  |  |
| 418 |  | 4 |
| ESM 425 | Watershed Hydrology | 4 |
| ESM 444 | Forest Ecology |  |

Students must take required courses for a differentiated grade and earn a C-or better for it to counttoward 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 ofexpertise 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 Oregon State leg is lature to address lake management and invasive species issues. Many of our faculty are active in the North American Lakes Management Society (NALMS) and the local chapters of the Oregon Lakes Association W ashington 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 studentmust complete courses in each of of the following five areas.

## Aquatic Ecology (10 credits)

Required
ESM 475 Limnology and Aquatic Ecology
ESM 477 Limnology Laboratory
Choose one from the following:
ESM 424 Wetland Ecology
ESM 426 Ecology of Streams and Rivers
ESM 474 Fish Ecology and Conservation

## Watershed Science (8 credits)

## Required

ESM 425 Watershed Hydrology
Choose one from the following:
ESM 427 Watershed Biogeochemistry
ESM Fate and Transport of Toxics in
479/CE 479 the Environment
Geog 414
Hydrology

## Business andManagement (8 credits)

| Choose two from the following |  |  |
| :--- | :--- | :--- |
| ESM 483 | Marine Conservation and | 4 |
|  | Management |  |
| ESM 485 | Ecology and Management of <br>  <br> Geog 446 | Bio-Invasions <br> Geog 494 |
| Water Resource Management | 4 |  |
| GIS for Water Resources | 4 |  |

Policy Legal and Governmental Aspects (7-8 credits)
Required
ESM 429
Environmental Impact
Assessment
Choose one from the following:

| ESM 435 | Natural ResourcePolicy and | 4 |
| :--- | :--- | :--- |
|  | Management | 3 |
| USP 571 | Environmental Policy | 3 |

Students must take required courses for a differentiated grade and earn a C-or better for it to counttoward 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.258) 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
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 $324 \quad 2$ Laboratory II
ESM 325 Environmental Risk Assessment 2

| Upper-division environmental <br> policy management courses <br> Upper-divis ion environmental <br> sciences courses | 4 |
| :--- | :--- |

Subtotal: 34
Environmental policy/management courses (minimum 4 credits) include selectedupper-divis ion courses in environmentalscience and management, economics, and geography. Environmental science courses (minimum 8 credits) include selected upper-division courses in environmental science. A list of approved courses is available from the Environmental Science and Managementoffice 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 counttoward 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 sus tainability 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
Orientation to Environmental Sciences and Management
UnSt 224 Environmental Sustainability
4
ESM 222 Applied Environmental Studies: 4 Policy Consideration Upper-division credits to include at least a total of four courses from the following three categories
Students must choose at least one course fromeach category.

| Economics and Business Iss ues |  |  |
| :--- | :--- | :--- |
| Ec 332U | Economics of Environmental | 4 |
|  | Issues |  |
| Ec 444 | Economics ofGreen Power | 4 |
| Ec 433/ESM | Advanced Natural Resource | 4 |
| 433 | Economics |  |
| Ec 434/ESM | Business Environmental | 4 |
| 434 | Management Economics |  |
| Ec 443/ESM | Global Environmental | 4 |
| 443 | 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 Is s ues |  |  |
| Arch 367U | Fundamentals of Environmental | 4 |
|  | Design |  |
| Geog 340U | Global Water Issues 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 | Environmental Ethics | 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 | 4 |
|  | Systems |  |
| USP 313U | Urban Environmental Is sues | 4 |
| USP 325U | Community and the Built | 4 |
|  | Environment |  |
| USP | Population and Society | 4 |
| 419/Soc 441 |  |  |
| Environmental and Ecological Is sues |  |  |
| 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 ofStreams 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 | Science and Policy ofClimate | 4 |
|  | Change |  |
| In addition, students must choose an appropriate caps tone or internship: |  |  |
| UnSt 421 | Capstone | 6 |
| ESM 450 | Case Studies in Environmental | 4-6 |
|  | ProblemSolving |  |

(A list of acceptable capstone and internship courses will be prepared foreach 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 counttoward satisfying the minor requirement.

NOTE: Students earning the minor in sustainability may not also earn thesustainable 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 curriculum that 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, \& SocietyPh.D. degree (p.205).

The following procedures are designed to assure that the student is qualified to pursue both the programitself and a successful career in environmental scienceand management.

## ADMISSION REQUIREMENTS

## Master of Science, Master of Environmental Management, and Professional Science Masters

In addition to the instructions for admission to the university 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 satis factory score
on the Test of English as a Foreign Language (TOEFL) is required for international students.
2. Three letters ofevaluation frompers ons qualified to assess the applicant's promise as a graduate student.
3. Evidence of undergraduate orgraduatecoursework in biology, chemistry, statistics, physics, and mathematics (including differential and integral calculus) approximately equivalent to the foundation course requirements for undergraduate 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 orCV.
7. Identification of advisers.

Prospectivestudents should contact the program for 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.

Univers ity 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, the student's adviser, and the student's graduate committee. The M.E.M. graduate committee consists of at leastthree 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 interdisciplinary 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. programof study consists of the following minimum credit requirements:
Courses
Core courses (one fromeach
16
core area and selected from
programlist and ESM 551)

| ESM 507 | Speakers Series Seminar <br> repeated 3 times, 1 credit per <br> term | 3 |
| :---: | :--- | ---: |
|  | Quantitative analysis (selected <br> from programlist) | 4 |
|  | Area of concentration | 12 |
|  | Elective and supporting courses | 4 |
| ESM 509 | Practicum | 1 |
| ESM 506 | Project | 5 |
| Subtotal:45 |  |  |

## 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 core courses 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 areas, 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 ofESM 506. This project is expected to be the product of original work in cooperation with an agency, organization, or firm involved in environmental management activities. The project plan, approach, and project report must be 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.

## ENVIRONMENTAL SCIENCE AND MANAGEMENT M.S.

Univers ity 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, the student's adviser, and the student's graduate committee. The M.S. graduate committee consists of at leastthree members including the major adviser. The major adv is er 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 interdisciplinary graduate study programs, guidelines for course selection are flexible. M.S. students must complete at least 45 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 |
| :--- | ---: |
| Speakers Series Seminar |  |
| repeated 3 times, 1 credit per |  |
| term | 3 |
| Quantitative analysis (selected | 4 |
| from programlist) |  |
| Area of concentration | 12 |
| Elective and supporting courses | 4 |
| Thes is | $6-12$ |

ESM 503
Subtotal: 45

## 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, 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 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 thes is, which complies with standards established by the Graduate School.

## ENVIRONMENTAL SCIENCE AND MANAGEMENT P.S.M.

Univers ity 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, the student's adviser, and the student's graduate committee. The P.S.M. graduate committee consists of at leastthree members including the major adviser. The major advis er 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 interdisciplinary graduate study programs, guidelines for course selection are flexible. P.S.M. students must complete at least 57 graduate credits.

## P.S.M. REQUIREMENTS

The P.S.M. programof 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 |  |
|  | term |  |
|  | Quantitative analysis (selected | 4 |
|  | from programlist) |  |
|  | Area of concentration |  |
|  | Elective and supporting courses | 12 |
| ESM 509 | Practicum | 1 |
| ESM 506 | Project | 5 |
|  | PSM "Plus" Courses | 12 |

Subtotal: 57

## 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, 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 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. W orking with local agencies or/and organizations, an ESM faculty member and possibly in a group ofother 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 theresults 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 ( 12 credits) focused on businessand professional management and practices. These "Plus Courses" are what distinguish theP.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" (project management, communication, law/policy, 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 Hy drology | 4 | G 543 | Ground Water Geology | 4 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 565/ESM |  |  | G 544 | Well Dynamics | 4 |
| 525 |  |  | G 545 | Geochemistry | 4 |
| G 566 | Glaciology | 4 | G 548 | Chemical Hydrogeology | 4 |
| Geog 514 | Hydrology | 4 | G 566 | Glaciology | 4 |
|  |  |  | Geog 514 | Hydrology | 4 |
| Subtotal: 4 |  |  | Geog 547 | Urban Streams | 4 |
| Hydrogeology Core |  |  | Geog 594 | GIS for Water Resources | 4 |
| Take one of the following: |  |  | Ph 526 | Thermodynamics and Statistical | 4 |
| CE 569 | Subsurface Hydrology | 4 |  | Mechanics |  |
| ESM | Fate and Transport ofToxics in | 4 |  |  |  |
| 579/CE 579 | the Environment |  | Category II Elective |  |  |
| G 543 | Ground Water Geology | 4 |  |  |  |
| G 545 | Geochemistry | 4 | Take two of th | following: |  |
|  | Subtotal: 4 |  | Bi 523 | Microbial Ecology | 4 |
| Water Quality Core |  |  | CE 561 | Water ResourceSystems | 4 |
| Take one of the following: |  |  | CE | Watershed Hydrology | 4 |
| CE 578 | Water Quality Modeling | 4 | 565/ESM |  |  |
| ESM 527 | Watershed Biogeochemistry | 4 | 525 |  |  |
| ESM 575 | Limnology and Aquatic Ecology | 4 | CE | EnvironmentalData Analysis | 4 |
| ESM | Fate and Transport of Toxics in | 4 | 566/ESM |  |  |
| 579/CE 579 | the Environment |  | 566 |  |  |
| G 545 | Geochemistry | 4 | CE 569 | Subsurface Hydrology | 4 |
| G 548 | Chemical Hydrogeology | 4 | CE 572 | EnvironmentalFluid Mechanical | 4 |
| Subtotal: 4 |  |  |  | Transport |  |
| Category I Elective |  |  | CE 573 | Numerical Methods in | 4 |
| Take one ofthe following: |  |  |  | Resources Engineering |  |
| CE 561 | Water Resource Systems |  | CE 574 | Unit Operations of | 4 |
|  | Analysis |  |  | Environmental Engineering |  |
| CE | Watershed Hydrology | 4 | CE 576 | Environmental Fluid Mechanics | 4 |
| 565/ESM |  |  | CE 578 | Water Quality Modeling | 4 |
| 525 |  |  | CE 581 | The Columbia River as a System | 2 |
| CE | EnvironmentalData Analysis | 4 | CE 582 | Introduction to Sediment | 4 |
| 566/ESM |  |  |  | Transport |  |
| 566 |  |  | CE 583 | Estuarine Circulation | 4 |
| CE 569 | Subsurface Hydrology | 4 | CE 587/Ch | Aquatic Chemistry | 4 |
| CE 572 | Environmental Fluid Mechanical | 4 |  |  |  |
|  | Transport |  | CE 590 | Soil and Groundwater | 4 |
| CE 576 | Environmental Fluid Mechanics | 4 |  | Restoration |  |
| CE 578 | Water Quality Modeling | 4 | ESM 563 | Water Quality Policy \& | 4 |
| CE 581 | The Columbia River as a System | 2 |  | Management |  |
| CE 587/Ch | Aquatic Chemistry | 4 | ESM 567 | Multivariate Analysis of | 4 |
| 587 |  |  |  | Environmental DataAtmospheric Physics |  |
| CE 590 | Soil and Groundwater | 4 | ESM 571/Ph |  | 4 |
|  | Restoration |  | 571 |  |  |
| ESM 520 | Ecological Toxicology | 4 | ESM 573 | Phytoplankton Ecology | 4 |
| ESM 524 | Wetland Ecology | 4 | ESM 575 | Limnology and Aquatic Ecology | 4 |
| ESM 526 | Ecology ofStreams and Rivers | 4 | ESM 577 | Limnology Laboratory | 2 |
| ESM 527 | Watershed Biogeochemistry | 4 | ESM | Fate and Transport of Toxics in | 4 |
| ESM 575 | Limnology and Aquatic Ecology | 4 | 579/CE 579 | the Environment |  |
| ESM 577 | Limnology Laboratory | 2 | ESM 580 | Coastal Marine Ecology | 4 |
| ESM | Fate and Transport of Toxics in | 4 | ESM 583 | Marine Conservation and | 4 |
| 579/CE 579 | the Environment |  |  | Management |  |


| G 520 | Applied Geophysics | 4 |
| :---: | :---: | :---: |
| G 523 | Statistics and Data Analysis in the Geosciences | 4 |
| G 524 | Geographical Information | 4 |
|  | Systems forthe Natural Sciences |  |
| G 543 | Ground Water Geology | 4 |
| G 544 | WellDynamics | 4 |
| G 545 | Geochemistry | 4 |
| G 547 | EnvironmentalSediment | 4 |
|  | Transport |  |
| 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-environmentalImpact Assessment | 4 |
| Geog 514 | Hydrology | 4 |
| Geog 546 | Water Resource Management | 4 |
| Geog 547 | Urban Streams | 4 |
| Geog 580 | Remote Sensing and Image | 4 |
|  | Analysis |  |
| Geog 581 | Digital Image Analys is I: | 4 |
|  | Introduction |  |
| Geog | Geographic Information Systems | 4 |
| 588/USP | I: Introduction |  |
| 591 |  |  |
| Geog 594 | GIS for W ater 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.
- Minor
- Minor in GIS
- Minor in Water Resources
- Minor in Climate Change Science and Adaptation
- Secondary Education Program-SocialScience
- M.A., M.S.
- 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 environmentalstudies 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 humanenvironmentinteractions. Techniques classes (in GIS, remote sensing, cartography, and spatial analysis) provide the tools to analyze complex local, regional, and global phenomena. Access to the Pacific Coast and the Cascade Mountains provides ample opportunity for fieldwork-based classes andopportunities for research. The PSU
Department ofGeography is an excellent choice for undergraduate and graduate students with interests in the linkages between human and natural systems.
Faculty engage 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 AmazonBasin, Sub-saharan Africa, 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 programgives students an appreciation and understanding of the human environment on 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 resource 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

Admis sion 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), 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 | Physical Geography | 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 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 Issues and | 4 |
|  | Sustainability |  |
| Geog 407 | Seminar in Physical Geography | 4 |
| Geog 412 | Global Climate Change Science and Socio-environmentalImpact | 4 |
|  | Assessment |  |
| Geog 413 | Disturbance Biogeography of | 4 |
|  | Pacific Northwest |  |
| 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 Political Ecology | 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 Africa | 4 |
| 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 Resource Management | 4 |
| Geog 447 | Urban Streams | 4 |
| Geog 448 | The Urban Forest | 4 |
| Geog 462 | Sense ofPlace | 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 Analys is \& | 2 |
|  | Visualization |  |


| Geog 477 | Photogrammetry and LiDAR | 2 |
| :---: | :---: | :---: |
| Geog 480 | Remote Sensing and Image | 4 |
|  | Analysis |  |
| Geog 481 | Digital Image Analys is 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 |  |  |
| 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 W ater Resources | 4 |
| Geog 495 | Maps, Models, and GIS | 4 |
| Geog 496 | Introduction to 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 departmentmajor requirements.
All cours es used to satis fy the departmental major requirements must be graded C - or above.

## GEOGRAPHY MINOR

To earn a minor in geography a student must complete a minimum of 28 credits in geography (at least 12 credits of which must be taken in residenceat Portland State University, and 16 credits of which must be upperdivision), to includethe following:

## REQUIREMENTS

| Courses | Peog 210 | Physical Geography |
| :---: | :--- | ---: |$\quad 4$

Subtotal: 28

## REQUIREMENTS

To earn a minor in GIS (Geographic Information Systems) a student must completea minimum of 28 credits in geography (at least 16 credits must be taken in residence at Portland State University), to include the following:

| Core cours es: (16 credits) |  |  |
| :---: | :---: | :---: |
| Geog 210 | Physical Geography | 4 |
|  | or |  |
| Geog 230 | Environment and Society: | 4 |
|  | Global Perspectives |  |
| Geog | Geographic Information Systems | 4 |
| 488/USP | I: Introduction |  |
| 591 |  |  |
| Geog | Geographic Information Systems | 4 |
| 492/USP | II: Advanced GIS |  |
| 592 |  |  |

Plus three additional courses from the list of electives: (12 credits)

| Geog 475 | Digital Compilation and | 4 |
| :--- | :--- | :--- |
|  | Database Design |  |


| Geog 480 | Remote Sensing and Image <br> Analysis |
| :--- | :--- |

Geog $481 \quad$ Digital Image Analys is I: 4
Geog $482 \quad$ Digital Image Analys is II:
Geog 484 Cartographic Applications of GIS
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 Water Resources 4
Geog 495 Maps, Models, and GIS 4
Geog 496 Introductionto Spatial 4 Quantitative Analysis
Geog 497 Advanced Spatial Quantitative

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 from the list of electives that will be uniquely applied to the GIS minor.
Students considering the GIS minor are strongly encouraged to meet with a geo graphy adviser to work out an instructional programthat best meets their needs.

## CLIMATE CHANGE SCIENCE AND ADAPTATION MINOR

Students will need to completeat least 27 credits to complete the Climate Change Scienceand Adaptation Minor. The minor may be earned simultaneously with a BA or BS degree or postbaccalaureate 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 Minor OR both the Environmental Science(or Studies) 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 Water Resources | 4 |
| :---: | :---: | :---: |
| 310U/Sci |  |  |
| 333 U |  |  |
| Geog 311U | Climatology | 4 |
| Geog | Climate Variability and Change | 4 |
| 312U/Sci |  |  |
| 334U |  |  |
| Geog 314U | Severe Weather | 4 |
| Ph 375U | Climate Change and Human Life | 4 |
| Geog 412 | Global Climate Change Science and Socio-environmental Impact | 4 |
|  | Assessment |  |
| ESM 464 | Climate Adaptation: Managing | 4 |
|  | Environmental Risks and |  |
|  | Vulnerabilities |  |

Subtotal: 20

## ELECTIVES

## Management and Policy Track

At least one course selected needs to be at the 400-level:
Geog Climate and Water Resources 4
310U/Sci
333U
Phl310U EnvironmentalEthics 4
USP 313U Urban Environmental Issues 4
Ec 332U Economics of Environmental 4
ESM 335 Introductionto Environmental 4
Management
Geog 340U Global Water Issues and 4
Sustainability
Geog 345U Resource Management

| Geog 412 | Global Climate Change Science and Socio-environmental Impact Assessment | 4 |
| :---: | :---: | :---: |
| ESM 416 | EcosystemRestoration | 4 |
| Ec 430 | Resource and Environmental Economics | 4 |
| ESM 435 | Natural ResourcePolicy and Management | 4 |
| Ec 443/ESM | Global Environmental | 4 |
| 443 | Economics |  |
| Ec 444 | Economics ofGreen Power | 4 |
| Geog 445 | Resource Management Topics | 4 |
| Geog 446 | Water Resource Management | 4 |
| Phl 449 | Philosophy of Sus tainability | 4 |
| ESM 462 | Climate Change Impacts, Adaptations and Responses: Geosphere and Anthrosphere | 4 |
| ESM 464 | Climate Adaptation: Managing Environmental Risks and Vulnerabilities | 4 |
| Soc 465 | Environmental Sociology | 4 |
| USP 490 | Green Economics and | 3 |
|  | Sustainable Development |  |
| ESM 499 | Special Studies | -8 |
| 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 |  |  |
| 333 U |  |  |
| SySc 330U | Models in Science | 4 |
| Ph 375U | Climate Change andHuman Life | 4 |
| Geog 412 | Global Climate Change Science and Socio-environmentalImpact Assessment | 4 |
| Geog 413 | Disturbance Biogeography of Pacific Northwest | 4 |
| Geog 414 | Hydrology | 4 |
| Geog | Landscape Ecology | 4 |
| 418/ESM |  |  |
| 418 |  |  |
| ESM 425 | W atershed Hydrology | 4 |
| ESM 427 | W atershed Biogeochemistry | 4 |
| ESM 471/Ph | Atmospheric Physics | 4 |
| 471 |  |  |
| ESM | Air Quality | 4 |
| 460/CE 488 |  |  |
| CE 489 | Introduction to Advanced | 4 |
|  | EnvironmentalFluid Mechanics |  |

Subtotal: 8

Total Credit Hours: 27-28
GEOGRAPHY SECONDARY EDUCATION PROGRAM

## Adviser: See CLAS Advising

(See Interdisciplinary Studies (p. 279))

## 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 also participates 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 program in geography for students planning to take advanced work leading to professional careers in univers ity teaching, res earch, 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 admission requirements for advanced degrees the student must 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), distributed as follows: 8 credits of core courses and 12 credits ofelectives. All certificate requirements must be fulfilled within three calendar years of admis sion. Courses taken three years before the programcompletion date cannot 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 |  |  |
| :--- | :--- | ---: |
| Geog Geographic Information Systems 4 <br> 591 I: Introduction  <br>    <br> Geog 588L And 0 <br>  GIS Lab  <br> Geog Geographic Information Systems 4 <br> $592 / \mathrm{USP}$ II: Advanced GIS  <br> 592   <br>  And 0,Geog 592L | GIS II Lab |  |

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 fromthose courses must be submitted as part of the waiver request.
W aivers 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 fromthe following list to fulfill the required 8 credits of core curriculum:

Geog 575 Digital Compilation and Database Design(4)
Geog 581 Digital Image Analysis I: Introduction (4)
Geog 597 SpatialQuantitative Analysis (4)
Subtotal: 8

## ELECTIVES

12 credits fromthis list or similar discrete-numbered courses approved in advance by the director.
Courses
G 525
Field GIS
4
Geog 575
Digital Compilation and Database Design
Geog 580 Remote Sensing and Image Analysis

Geog $581 \quad$ Digital Image Analys is I: 4
Introduction
Geog $582 \quad$ Digital Image Analys is II:
Advanced Remote Sensing
Geog 584 Cartographic Applications of
GIS
Geog $585 \quad$ Map Design and Production 4
Geog 589 Building a GIS Database with 4 GPS
Geog 590
Geog 594
Geog 59
Geog 597 Advanced SpatialQuantitative
Analysis
USP 543

USP 593
Geographic Applications to
Planning
Public Participation GIS

## Subtotal: 12

Total Credit Hours: 20

## Program Completion Application

Application for award of the Graduate Certificate must be filed by the student in the GraduateSchool no later than the first week of the anticipated termof graduation (deadlines foreach termare available at the Graduate School).

## Transfer Credits

Transfer credit is defined as eligible graduatecredit 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 must be letter-graded with a B or higher and eligible for use in master's degree programs at PSU. The Proposed Transfer Credit form(GO-11GC) must be used for approval of trans fer credit.

## Experimental 510 Courses

Due to the fast developments in geospatial technologies, some experimental courses 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 studentcan havea 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 trans fer credit limitations apply.

Subtotal: 8

## Course Overlap between Degrees and Certificates

Graduate courses can be applied to a master's (or a doctoral) degree and a graduate certificate. However, graduate courses cannot be applied to two different graduate certificates. See PSU Bulletin for more information about course overlap.

## 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 termafteradmission to the program). The programofstudy must include a minimum of 45 graduatecredits. 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 forminimum and continuous enrollment.
The programconsists of coursework in the following areas:

| Core Geography Courses |  |  |
| :--- | :--- | :--- |
| Geog 572 | Critical GIS | 2 |
| Geog 591 | Professionalismin GIS | 2 |
| Geog 522 | Research Design | 4 |
| Geog | Geographic Information Systems | 4 |
| $592 / \mathrm{USP}$ | II: Advanced GIS |  |
| 592 |  |  |

Subtotal: 12

## Core GIS Competency Courses

[^2]
## Non-GIS Topical

4 credits of graduate-level non-GIS courses (with approval of the committee)

Subtotal: 4
Specialized Geospatial 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 Analys is I: | 4 |
| Geog 582 | Introduction <br> Digital Image Analys is II: <br> Advanced Remote Sensing | 4 |
| Geog 577 | Photogrammetry and LiDAR | 2 |

Area 2: Cartography and geovisualization
Geog $584 \quad$ Cartographic Applications of GIS
Geog 585 Map Design and Production
Area 3: Computer and information sciences
CS $520 \quad \begin{aligned} & \text { Object-Oriented Programming \& } \\ & \text { Design }\end{aligned}$
CS 547 Computer Graphics 3
CS 549 Computational Geometry 3
CS 554 Software Engineering 3
Geog 575 Digital Compilation and 4
Geog $590 \quad$ GIS Programming 4
Geog 595 Maps, Models, and GIS 4
Area 4: Spatial statistics andquantitative methods
ESM EnvironmentalData Analysis 4
566/CE 566
ESM 567 Multivariate Analysis of 4
EnvironmentalData
Geog 597 Advanced SpatialQuantitative
Analysis
Area 5: System and data science
CS 541 Artificial Intelligence 3
CS 542 Advanced Artificial Intelligence: 3
CS 543 Advanced Artificial Intelligence: 3
CS 545 Machine Learning 3
SySc $514 \quad$ SystemDynamics 4
SySc 525 Agent Based Simulation 4
SySc 527 Discrete SystemSimulation 4
SySc 531 Data Mining with Information 4
SySc $535 \quad$ Modeling \& Simulation with R 4
SySc 540 Introduction to Network Science

| SySc 552 | Game Theory | 4 |
| :--- | :--- | :--- |
| SySc 575 | AI: NeuralNetworks I | 4 |

Subtotal: 6-8
Students may need to complete additional courses to meet the prerequisite requirements for a course. Please check with the instructor before registering.

## GIS Practicum

Geog 509 Practicum
Subtotal: 6

## Electives

| Graduate-level GIS courses or seminars: |  |  |
| :--- | :--- | :--- |
| G 525 | Field GIS | 4 |
| Geog 507 | Seminar: Speaker Series | 1 |
| Geog 576 | 3D Terrain Analysis \& | 2 |
|  | Visualization |  |
| Geog 589 | Building a GIS Database with <br>  <br> Geog 594 GPS | 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.51).
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 res idence (the first termafter admis sion to the program). The programofstudy must includea 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 defenseof the thesis.

Candidates electing the non-thesis option must register for 3 credits ofGeog 501 Research to rewrite, edit, and revise a research paperor 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 theUniversity 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)
- Ph.D. in Earth, Environment, \& Society


## Undergraduate Programs

The Department of Geology offers programs leading to the bachelor's degree in geology and earth science, as well as studies in geochemistry, planetary science, volcanology, glaciology, hydrogeology, and environmental and engineeringgeology.
The programs serveboth 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 should 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:

## REQUIREMENTS

Geology Courses (46-47 credits):
G 201 Dynamic Earth: Interior 3

G 202 Dynamic Earth: Surface
G 204 Geology Laboratory 1
G 205 Geology Laboratory 1
G 207 Computer Based Geology
Laboratory
G 203 Historical Geology 3
G 206 Historical Geology Lab 1
G312 Mineralogy 3
G313 Methods in Mineralogy 2
G314 Petrology 3
G315 Lithology and Petrography 2
G318 Processes in the Surface 3
G $319 \quad 2$
G324 $\begin{array}{ll}\text { Environment:Methods } \\ \text { Data Managementand Analysis }\end{array}$
G434 Structural Geology and Tectonics 5
G 435 Sedimentology and Stratigraphy 5
G485 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 numbered G410 or higher:

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 or statistics course ( 12 credits):
Mth $251 \quad$ Calculus I 4
Mth 252 Calculus II 4
and
Mth 253 Calculus III
or
Mth 261 Introduction to Linear Algebra
or
Stat 451 Applied Statistics for Engineers and Scientists I
AlliedSciences Courses ( 25 credits):
Two terms of 200-level chemistry with labs:
Ch 221 General Chemistry I
Ch 227 General Chemistry Laboratory 1
Ch 222 General Chemistry II 4
Ch 228 General Chemistry Laboratory 1
Two terms of200-level physics
with labs:
General Physics 4
And
General Physics 4
or
General Physics
or
Ph 211 General Physics (with Calculus) 4
I
And
Ph $212 \quad$ General Physics (with Calculus) 4
II
or
Ph $213 \quad$ General Physics (with Calculus) 4 III

And
Ph 214 Lab for Ph 201 or Ph 211 or Ph 221 or Ph 231
and



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 residenceat 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 |  |
| G 205 | Geology Laboratory |  |
| G 207 | Computer Based Geology <br> Laboratory | 1 |
|  | Twenty upper-division credits in <br> geology | 20 |
|  |  |  |

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 residenceat PSU) to include the following:

## Courses

G 200
Field Studies

| G 201 | Dynamic Earth: Interior | 3 |
| :---: | :---: | :---: |
| G 202 | Dynamic Earth: Surface | 3 |
| G 204 | Geology Laboratory | 1 |
| G 205 | Geology Laboratory | 1 |
| G 207 |  |  |
|  | Laboratory | 2 |
| G 460 | Soil Geomorphology | 4 |
|  | or |  |
| G 461 | Environmental Geology | 4 |
| Sixteen up | 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 ofthe Oregon Country | 4 |
| G 424 | Geographical Information | 4 |
|  | Systems for the NaturalSciences |  |
| 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 |
| Subtotal: 29 |  |  |

## 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

G 204 Geology Laboratory 1
G 202 Dynamic Earth: Surface 3
G 205 Geology Laboratory 1

## or

G 207 Computer Based Geology 2
Laboratory
or
Ph 121 General Astronomy 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 <br> G 206 | Historical Geology Lab |
| :--- | :--- | ---: |
|  | or | 1 |
| G 340U | Life of the Past | 4 |
|  |  |  |
| G 345U | Life in the Universe | 4 |
| G 346 | Exploring Mars |  |
|  |  |  |
| G 456 | Astrogeology | 4 |
| G 446 | Meteorites | 4 |
| G 404 | CooperativeEducation/Intemship | $1-2$ |
| G 405 | Reading and Conference | $1-2$ |

## Subtotal: 28

Pass/No Pass: Upperdivision courses must be taken for a letter grade to count toward fulfilling department minor requirements with the exceptions of 404 and G 405, which are offered only forpass/nopass.

Prerequisite requirements exist only for G446 Meteorites (G201 and one yearofchemistry). This is theonly course in the programthat has a prerequis ite.

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.

COMPUTER APPLICATIONS WITH AN EMPHASIS IN GEOSCIENCES MINOR

## REQUIREMENTS

To earn a minor in computer applications with an emphasis in geosciences, a student must complete 30 credits (at least 24 credits of which mustbe taken in residenceat PSU) to include the following:

## Courses

| G 324 | Data Managementand Analysis | 5 |
| :--- | :--- | ---: |
| G326 | Numerical Modeling of Earth | 5 |
|  | Systems |  |
|  | Lower Division Computer | 4 |
|  | Science |  |
|  | Three adviser-approved courses <br> in advanced computer <br> applications, with at least 4 <br> credits outside of geology | 12 |
|  |  |  |

Data Managementand Analysis
Numerical Modeling of Earth

A one-term, adviser-approved, upper-division research project or practicum

Adviser-approved courses in advanced computer applications: these courses may come from any unit in the Univers ity but may not include 405 reading/conference courses
Subtotal: 30

## Graduate Programs

The Department ofGeology 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), and to the Earth, Environment, \& Society Doctoral Program.

The M.A./M.S. programis des igned to train geology students beyond the baccalaureate degree for professional employment or for advanced graduate work. The M.A.T./M.S.T. program is 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, geomechanics, glaciology, and applied stratigraphy, along with multidis ciplinary environmental science courses and seminars, will partially fulfill the requirements for the Ph.D. See Earth, Environment and Society Ph.D. (p. 205) 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. It is required that the General Graduate Record Examination be taken before admission.

## 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. Students must take the general Graduate Record Examination and submit scores before admis sion for advising purposes.

## 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 undergraduateGPAs between 2.50 and 2.74 may be considered for conditional admission only.

## GEOLOGY M.A./M.S.

See University master's degree requirements (p.51). 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 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 fromG 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, or G 506 Special Problems. These courses are offered for $\mathrm{P} / \mathrm{NP}$ credit only.
e. Students must complete at least 6 credits of G503 Thesis ( $\mathrm{P} / \mathrm{NP}$ only); up to 9 credits can count for the degree.
2. The department will evaluate a student's record for deficiencies at thetime of admission and developa list of courses that mustbe completed for a grade of B or better in each course within a length of time specified in the admiss ion letter.
3. Completion of field camp (could have beentaken 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 (thesis 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. GeologyGeohydrology with a non-the sis (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 fromG 510 or higher-level courses.
d. Studentmust 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 CooperativeEducation/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 developa list of courses that must be completed for a grade of Bor better in each course within a length of time specified in the admission letter.
3. Completion offield camp (could have been taken as an undergraduate) or equivalent field experience as approved by the field camp director.
4. Presentation of 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 studentmust 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 accessible way to obtain skills in engineering geology while partially fulfilling requirements towards a Professional Masters. The certificate is designed to accommodate professionals and students who are employed fullorpart-time.

## Career Opportunities

This Certificate is designed for professionals and students interested in the field of eng ineering 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 stateofOregon. 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
FOLIOWING 4 SECTIONS: FOLLOWING 4 SECTIONS:

| Required: G 570 | Engineering 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: |  |  |
| CE 537 | Earthquake Engineering | 4 |
| CE 541 | Advanced Soil Mechanics | 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 |
| CE 546 | Numerical Methods in SoilStructure Interaction | 4 |
| CE 549 | Deep Foundation Design and Analysis | 4 |
| CE 550 | Transportation Safety Analysis | 4 |
| CE 569 | Subsurface Hydrology | 4 |
| Geog 580 | Remote Sensing and Image Analysis | 4 |
| Geog | Geographic Information Systems | 4 |
| 588/USP | I : Introduction |  |
|  |  | 4 |
| 592/USP | II: Advanced GIS | 4 |
| 592 |  |  |
| **IfG 524 or G 525 is taken toward this certificate, then |  |  |
| Geog 588 an count towar | Geog 592 may not be taken fromth hese 4 credits. |  |


| Choose One: |  |  |
| :---: | :--- | :---: |
| G524 | Geographical Information <br> Systems for the NaturalSciences | 4 |
| G525 | Field GIS | 4 |
| G562 | Hillslope Materials and | 4 |
|  | Processes |  |
| G576 | Earthquake Geology | 4 |
| G580 | Basin Analysis | 4 |
| G581 | Field Geology | 4 |

## Total Credit Hours: 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 beused 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 StateUniversity.

## 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 Professional 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 registered 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: |  |  |
| :--- | :--- | :--- |
| G561 | Environmental Geology | 4 |
| Choose One: |  |  |
| G650 | Research Methods I - Reading | 4 |
| G651 | Research Methods II - Writing | 4 |
| G523 | Statistics and Data Analysis in <br> 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 | Hills lope 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 | EnvironmentalData 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 | Environmental Fluid Mechanical Transport | 4 |
| CE 573 | Numerical Methods in | 4 |
|  | Environmental and Water |  |
|  | Resources Engineering |  |
| CE 576 | EnvironmentalFluid Mechanics | 4 |
| CE 578 | Water Quality Modeling | 4 |
| CE | Fate and Transport ofToxics in | 4 |
| 579/ESM | the Environment |  |
| 579 |  |  |
| CE 580 | Chemistry of Environmental | 4 |
|  | Toxins |  |
| CE 582 | Introduction to Sediment | 4 |
|  | Transport |  |
| CE 583 | Estuarine Circulation | 4 |
| CE 585 | EnvironmentalCleanupand | 4 |
|  | Restoration |  |
| CE 586/Ch | EnvironmentalChemistry | 4 |
| 586 |  |  |
| CE 587/Ch | Aquatic Chemistry | 4 |
| 587 |  |  |
| CE 589 | Introduction to Advanced | 4 |
|  | EnvironmentalFluid Mechanics |  |
| CE 590 | Soil and Groundwater | 4 |
|  | Restoration |  |
| ESM 516 | EcosystemRestoration | 4 |
| ESM 517 | Applied Watershed Restoration | 4 |
| ESM | Landscape Ecology | 4 |
| 518/Geog |  |  |
| 518 |  |  |


| ESM 520 | Ecological Toxicology | 4 |
| :---: | :---: | :---: |
| ESM 527 | Watershed Biogeochemistry | 4 |
| ESM 529 | Environmental Impact | 4 |
|  | Assessment |  |
| ESM 533/Ec | Natural Resource Economics | 4 |
| 533 |  |  |
| ESM 535 | Natural Resource Policy and | 4 |
|  | Management |  |
| ESM 552 | Environmental Regulation and | 3 |
|  | Non-regulatory Approaches |  |
| ESM 563 | Water Quality Policy \& | 4 |
|  | Management |  |
| ESM 567 | Multivariate Analysis of | 4 |
|  | EnvironmentalData |  |
| Geog 514 | Hydrology | 4 |
| Geog 515 | Soils and Land Use | 4 |
| Geog 546 | Water Resource Management | 4 |
| Geog 547 | Urban Streams | 4 |
| Geog 548 | The Urban Forest | 4 |
| Geog 580 | Remote Sensing and Image | 4 |
|  | Analysis |  |
| Geog | Geographic Information Systems | 4 |
| 588/USP | I: Introduction |  |
| 591 |  |  |
| Geog | Geographic Information Systems | 4 |
| 592/USP | II: Advanced GIS |  |
| 592 |  |  |
| Geog 594 | GIS for WaterResources | 4 |
| Geog 596 | Introductionto Spatial | 4 |
|  | Quantitative Analysis |  |
| Geog 597 | Advanced SpatialQuantitative Analysis | 4 |
|  | Analysis |  |
| **IfG 524 or G 525 is taken toward this certificate, then |  |  |
| Geog 588, Geog 592, and Geog 594 may not be taken from this list to count toward these 4 credits. |  |  |
| Total Credit Hours: 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 beused 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 StateUniversity. |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
| GRADUATE CERTIFICATE IN HYDROGEOLOGY |  |  |

## Purpose

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. The certificate is designed to accommodate
professionals and students who are employed full or parttime.

## Career Opportunities

This Certificate is designed for professionals and students interested in the field of hydrogeology. It can represent a portion of a professional geologist's recognized training, as well as a portion of the background needed by registered geologists in the state ofOregon. Practicing geologis ts can use this Certificate, which indicates added skills and background, for professional development. This Certificate programalso may be used toward a graduate degree.

## CHOOSE 1 COURSE FROM EACH OF THE FOLLOWING 4 SECTIONS:

| $\begin{aligned} & \text { Required: } \\ & \text { G } 543 \end{aligned}$ | Ground W ater 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 548 | Chemical Hydrogeology | 4 |
| G 561 | Environmental Geology | 4 |
| G 580 | Bas in Analysis | 4 |
| G 581 | Field Geology | 4 |
| Choose One: |  |  |
| CE | Watershed Hydrology | 4 |
| 565/ESM |  |  |
| CE | Environmental Data Analysis | 4 |
| 566/ESM |  |  |
| 566 |  |  |
| CE 568 | Advanced Methods in | 4 |
|  | Hydrologic SystemAnalysis |  |
| CE 571/CE | Subsurface Contaminant | 4 |
| 671 | Transport |  |
| CE 572 | Environmental Fluid 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 | Fate and Transport of Toxics in | 4 |
| 579/ESM | the Environment |  |
| 579 |  |  |
| CE 580 | Chemistry of Environmental | 4 |
|  | Toxins |  |


| CE 585 | EnvironmentalCleanup and Restoration | 4 |
| :---: | :---: | :---: |
| CE 586/Ch | EnvironmentalChemistry | 4 |
| 586 |  |  |
| CE 587/Ch | Aquatic Chemistry | 4 |
| 587 |  |  |
| CE 589 | Introductionto Advanced | 4 |
|  | EnvironmentalFluid Mechanics |  |
| CE 590 | Soil and Groundwater | 4 |
|  | Restoration |  |
| ESM 520 | Ecological Toxicology | 4 |
| ESM 527 | Watershed Biogeochemistry | 4 |
| ESM 535 | Natural Resource Policy and | 4 |
|  | Management |  |
| ESM 552 | Environmental Regulation and | 3 |
|  | Non-regulatory Approaches |  |
| ESM 563 | Water Quality Policy \& | 4 |
|  | Management |  |
| ESM 567 | Multivariate Analysis of | 4 |
|  | EnvironmentalData |  |
| Geog 514 | Hydrology | 4 |
| Geog 580 | Remote Sensing and Image | 4 |
|  | Analysis |  |
| Geog 594 | GIS for Water Resources | 4 |

**IfG 524 or G 525 is taken toward this certificate then Geog 594 may not be taken from this list to count toward these 4 credits.
Total Credit Hours: 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 beused 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.

## History

441 Cramer Hall (CH)
725-3917
www.pdx.edu/history/

- B.A., B.S.
- Minor in History
- Minor in World History
- Minor in Science, Technology, and Society
- Minor in MedievalStudies
- M.A.


## Undergraduate Program

Students of history, through investigation of the past, gain skills and perspectives that foster a better understanding of the world and their place in it. The study ofhistory
contributes to the goals of a liberal arts education by enabling students to gain a deep appreciation of the diversity of human experience over time. Through the study of his tory, students learn how to interpret their own experience and to shape their own values by engaging in dialogues with the past. The study of history also nurtures the ability to view the world from multiple pers pectives, including interdisciplinary ones. Finally, history provides the foundation for informed participation in both the local and the global community by teaching how to apply critical thinking skills to solving problems. The study of history offers excellent training for a variety of occupations, fromteaching to law, government, business, and the arts.

The Department ofHistory encourages active engagement in historical inquiry, whether at the introductory survey level, in seminars, or in community-based learning. Active engagement requires students to learn how to master basic knowledge, askhistorical questions, access and evaluate information, and communicate what they have learned in both written and oral forms. Helping students master the use of a variety of sources and tools to unlock the past is a goal of all history courses.

The combined expertise of faculty in the Department of History encompasses a diversity of fields ranging from Oregon and thePacific Northwest to World History. The departmentoffers lower-divis ion surveys in World History and U.S. history, but the gateway course for the major is Hst 300 Historical Imagination, which provides an introduction to the discipline-both the theory and practice-of history. Upper-division offerings include a wide range of subject areas, from the Ancient Near East to American Family History. Reading seminars (Hst 491) and research seminars (Hst 492) on specialized topics-such as medieval Spain or Japanese nationalism-provide the opportunity for majors to write a substantial res earch paper and to participate in intensive reading and discussion of topics. Hst 490 Comparative World History - a thematic course-is required for the major to ensure that students develop the ability to frame what they know in a world historical context and to apply comparative analysis to important historical topics. 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 historical 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 dissemination through teaching and publication, is a vital part of the department's mission.

## 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

Admission to the department is based on general admission 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 mustmeet the departmental requirements listed:

## Courses

> Lower-division his tory electives
(20 maximum)
Hst $300 \quad$ Historical Imagination 4
Hst $490 \quad$ Comparative W orld History 4
Hst 491 Reading Seminar 4
Hst 492 Research Seminar 4
Upper-division electives in 24history 44
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 residenceat Portland State University.

Total Required Credits in History: 60

## HISTORY HONORS OPTION

The honors track in history affords outstanding his tory majors the opportunity to propose, carry out, and formally present independent res earch on a topic of their choosing, under the guidanceofa faculty adviser. Students who successfully complete an approved thesis and its as sociated 14 or 16 credit-hour department honors curriculum will be formally des ignated 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 admission 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 student develops a thesis topic in a reading and conference course (four credits ofHst 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 must complete 28 credits, 16 of which must be at the upper division leveland 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 history in residenceat Portland State University is required.


## WORLD HISTORY MINOR

## REQUIREMENTS

The World History Minor requires the completion of 28 credits fromthe following list of courses.

## Required Cours es

| Hst 390U | Topics in W orld History | 4 |
| :--- | :--- | :--- |
| Hst 490 | Comparative W orld History | 4 |

## Electives

Lower Division
Hst 104 Introduction to World History
Hst 105 Introductionto World History

Hst 106 Introduction to World History 4
$\begin{array}{ll}\text { Upper Division } & \\ \text { Hst 339U } & \text { The Environment and History }\end{array}$
Hst 361U Modern France \& the W orld 4
$\begin{array}{ll} & \text { since } 1815 \\ \text { Hst 369U Women in World History } & 4\end{array}$
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 Credit Hours: 28

All courses are to be taken for differentiated grades; pass/no pass courses cannotbe counted toward theminor. 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

[^3]| CS | Exploring Complexity in | 4 | For advising concerning the minor, consult the History |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 346U/SySc | Science and Technology |  | Department office. |  |  |
| 346U |  |  |  |  |  |
| Ec 460 | History of Economic Thought | 4 | MEDIEVAL STUDIES MINOR |  |  |
| Eng 307U | Science Fiction | 4 |  |  |  |
| Eng 397U | Digital Literary Studies | 4 | The interdisciplinary minor in medieval studies is an interdisciplinary programwith courses offered in the departments of Art History, English, History, Philosophy, W orld Languages and Literatures, and Theatre and Film. |  |  |
| Eng 498 | Ecology, Criticism, and Culture | 4 |  |  |  |
| ESM 330 | Environmental and Ecological | 4 |  |  |  |
| G 340U | Life of the Past | 4 | Students will fulfill 28 credits of coursework in a minimum of three disciplines, dis tributed as follows: |  |  |
| Geog 347U | Environmental Issues and Action | 4 |  |  |  |
| Geog 366U | Historical Geography of North America | 4 | - Courses must be completed in at least three separate departments or programs; |  |  |
| Hst 339U | The Environment and History | 4 | - At least 20 credit hours must be completed in upper |  |  |
| Hst 427 | Topics in the History of Science | 4 |  |  |  |
| Hst 440 | American Environmental History | 4 | division courses, with at least 8 of those credit hours at the 400 -level. |  |  |
| Hst 460 | Topics in European Intellectual | 4 | REQUIREMENTS |  |  |
|  |  |  | Courses may be selected from the list below: |  |  |
| Hst490 | Comparative World History: Empires ofKnowledge | 4 |  |  |  |
|  |  |  |  | Is lamic Art: Major Themes and |  |
| Hst 490 | Comparative World History: | 4 | $\begin{aligned} & \text { ArH355U } \\ & \text { ArH356U } \end{aligned}$ | Periods: <br> Medieval Monsters |  |
|  | Global Health |  |  | MedievalMonsters |  |
| Mth 486 | Topics in The History of | 3 |  | Early Medieval Art andArchitecture |  |
|  | Mathematics |  |  |  |  |
| Phl 301U | Ancient Philosophy | 4 | ArH357U | Byzantine Art and Architecture | 4 |
| Phl 303U | Early Modern Philosophy | 4 | ArH358U | Medicine and Magic in$4$ |  |
| Phl 306U | Science and Pseudoscience | 4 | ArH359U | Romanesque Art <br> Gothic Art and Architecture | 4 |
| Phl 307U | Introduction to the Philosophy of 4 SocialScience |  | ArH360U | The Art of War: Representing the Crusades |  |
| Phl 318U | Philosophy of Medicine | 4 |  |  |  |
| Phl 355U | Morality and Health Care | 4 | ArH361U | Northern Renaissance Art 4 |  |
| Phl 470 | Philosophy of Science | 4 | ArH371U | Italian Renais sance Art |  |
| Phl 471 | Topics in Philosophy of Science | 4 | ArH407 | Art History Seminar |  |
| PS 319U | Politics of the Environment | 4 | ArH432U | Issues in Gender and Art 4 |  |
| Sci 321U | Energy and Society I | 4 | Eng 319UEng 340U |  |  |
| Sci | Science, Gender, and Social | 4 |  |  | 4 |
| 348U/WS | Context II |  | Eng 426 | Advanced Topics in Medieval Literature |  |
| 348U |  |  |  |  |  |
| Sci 355U | Science Through Science Fiction The Science of Gendered Bodies | 4 | ENG 447 | Major Forces in Literature: <br> Arthurian Literature |  |
| Sci |  | 4 |  |  |  |
| 365U/WS |  |  | Eng 448 | Advanced Topics: MajorFigures in Literature | 4 |
| 365 U |  |  | ENG 449 |  |  |
| Soc 459 | Sociology of Health and | 4 |  | Advanced Topics in Cultural Studies: Medieval Women | 4 |
|  | Medicine |  |  |  |  |
|  |  |  | Fr 341U | Literature and Culture of the | 4 |
| Any course fromthe core list may count towards the |  |  |  | Middle Ages and Renaissance |  |
| elective requirements once the 12 -credit core requirement has been fulfilled. |  |  | Ger 341U | Introduction to German Literature | 4 |
| Hst 427: with different topics, may be repeated for credit |  |  | Grk 101-203 <br> Hst | First- and Second-year Greek Rabbinic Culture in the Roman | 44 |
|  |  |  |  |  |  |  |  |
| Hst 460: with different topics, may be repeated for credit |  |  | $\begin{aligned} & 319 \mathrm{U} / \mathrm{JSt} \\ & 319 \mathrm{U} \\ & \text { Hst } 350 \mathrm{U} \end{aligned}$ | World |  |
| Students should take note of any prerequisites established by the respective departments. |  |  |  | English History from 1066 to 1660 |  |
|  |  |  |  |  |  |  |  |  |


| Hst 352U | European Women's History to 1700 | 4 |
| :---: | :---: | :---: |
| Hst 354U | Early MedievalEurope: 3001100 | 4 |
| Hst 355U | Late MedievalEurope, 11001450 | 4 |
| Hst 416 | Topics in Roman History | 4 |
| Hst 450 | MedievalEngland | 4 |
| Hst 452 | Topics in the History of European Women | 4 |
| Hst 453 | The Medieval City: <br> Communities of Conflict and Consensus | 4 |
| Hst 454 | Topics in Medieval History | 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 Translation) | 4 |
| JSt | Jewish History from Antiquity to | 4 |
| $\begin{aligned} & 317 \mathrm{U} / \mathrm{Hst} \\ & 317 \mathrm{I} \end{aligned}$ | the Medieval Period |  |
| JSt | Rabbinic Culture in the Roman | 4 |
| 319U/Hst | World |  |
| 319 U |  |  |
| JSt | Pagans, Christians and Jews | 4 |
| $\begin{aligned} & 378 \mathrm{U} / \mathrm{Hst} \\ & 378 \mathrm{U} \end{aligned}$ |  |  |
| JSt | Kabbalah:The Jewish Mystical | 4 |
| 381U/Hst | Tradition |  |
| 381 U |  |  |
| Lat 101-203 | First-and Second-year Latin | 4 |
| Phl 302U | Medieval Philosophy | 4 |
| Span 341 | Pre-Modern Cultural and Literary Foundations | 4 |
| Span 441 | Major Works in Translation | 4 |
| UnSt 421 | Capstone | 1-6 |
| TA 471 | Theater History: Periods and Topics | 1-4 |
| UNST 421 | Medieval Portland Capstone | 4 |
| WLL 319U | Fairy Tales and Folklore | 4 |
| WLL 335U | The Icelandic Sagas | 4 |

Minor Coordinator approval required for: ArH 407, ArH 432U, ArH 450, Eng 448, Hst 378U, Hst 381U, Hst 452, Hst 461, Hst 491, Hst 492, Jpn 341U, Span 441

Fr 341U: taught in French
Ger 341U: taught in German
Span 341U: taught in Spanish
All courses must be passed with a C- or better.
For advising concerning the minor, please consult the History Department office.

## Graduate Program

## ADMISSION REQUIREMENTS

## Master of Arts

The Department of History offers a Master of Arts degree. The degree program is designed to develophistorians with special competence by systematic training in the content, methods, and interpretation of history. Although each degree program will 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 minimumpreparation 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 orstudents with a lowerhistory 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 admission are due by February 1.


## HISTORY M.A.

See University master's degree requirements (p.51). Specific departmental requirements for the M.A. in history are listed below.

## ALL STUDENTS

For either track in history a minimum of 45 credits of approved graduate-levelcourses 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 advised to take HST 500 in their first term of the program. Students willenter 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 ofstudy (defined geographically and / or thematically), any preparatory courses necessary for their thesis, and their thesis top ic 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) ofHST 503 (Thesis) in which they will complete their thesis.
- defend the thesis in an oral examination before a committee compris ing 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 adv iser 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 secondHST 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 ofHST 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 tenure-track 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 researchmay 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 afteradmission to the program.

## PUBLIC HISTORY CONCENTRATION

Students wishing to pursuea career in public history are urged to consider the department's public history M.A. concentration. Coursework is comprised of a balance of classroomand practical offerings, including supervised internships. Students in the thesis track may select a thesis topic within the public history field and/or one that makes use of public history methods (i.e., oral or digital history). Students in the examination track may select public his tory 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
(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. a minimum of 6 public history internshipcredits

Hst 504 Public History Internship
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 his tory concentration must fulfill all the requirements for a M.A. in History, in the track of their choosing, as wellas:

## 1.8 credits of Hst 590 Comparative WorldHistory

An appropriate advisor-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 and Native American Studies
- Minor in Indigenous Nations Studies

Indigenous Nations Studies (INST) is an interdis ciplinary department with coursework drawn fromemerging and Native scholars and interweaves Indigenous Ways of Knowing with elements from Anthropology, English, History, Public Adminis tration, Social W ork, and other departments and schools. The substantive focus of this curriculum is 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 generaladmis sion to the University. See Admissions 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 culturalecological 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 Issues in Indian | 4 |
|  | Country |  |
| NAS 392 | Indigenous Ways of Knowing | 4 |
| NAS 426 | Tribal Critical Race Theory | 4 |

Decolonizing Methodologies:
Insurgent Research and
Indigenous Education
Subtotal: 24

| Experiential Learning Requirement (8 credits) |  |  |
| :--- | :--- | :--- |
| NAS 404 | Cooperative Education/Internship | 4 |
| NAS 407 | Traditional EcologicalHealing <br> Practices | 4 |

Subtotal: 8

## Capstones

Students may complete these capstones as electives in INNAS, but must do so outside of their UNST graduation requirements.

| UnSt 421 | Cultural and Ecological <br> Education <br> Environmental Education <br> ThroughNative American | 6 |
| :--- | :--- | :--- |
|  | Lenses | 6 |
| UnSt 421 | Indigenous Grantwriting | 6 |
| UnSt421 |  <br> Empowerment at NAYA | 6 |
| UnSt 421 | Environmental Justice and <br> Salmon | 6 |

Electives ( $\mathbf{2 4}$ credits)
8 or more credits must be NAS courses; no more than 4 credits may be lower-division.

| NAS 301 | Introduction to Native American Languages | 4 |
| :---: | :---: | :---: |
| NAS 306 | Red Power |  |
| NAS334U | Topics in Film Genres and Movements |  |
| NAS | Topics in Literature and Film |  |
| $\begin{aligned} & \text { 335U/Eng } \\ & 335 \mathrm{U} \end{aligned}$ |  |  |
| NAS 342 | Indigenous Gardens and Food Justice |  |
| NAS 348 | Indigenous Practices for Environmental Sustainability |  |
| NAS 399 | Indigenous Sciences |  |
| NAS 399 | Native American Music |  |
| NAS 399 | Native American Politics \& Activism |  |
| NAS 399 | Queer Indigenous Studies |  |
| NAS 399 | Urban Indians |  |
| NAS 410 | Decolonizing via Indigenous Art |  |
| NAS 411 | Nationhood: Tribal Sovereignty, Governance \& Policy |  |
| NAS417 | Maintenance and Revitalization of Endangered Languages |  |
| Anth 314U | Native Americans |  |
| Anth 320 | Indigenous Peoples of the |  |
|  | Pacific Northwest Coast |  |


| Anth 417 | Advanced Topics in Native <br> American Studies | 4 |
| :--- | :--- | :--- |
| Anth 422 | Tribal Sovereignty and Policy <br> Anth 456 <br>  <br> Cultural and Heritage Res ources <br> Management | 4 |
| Cuba, Dominican Republic, | 4 |  |
| ChLa 303U | Puerto Rico <br> Chicana/Latina Experience <br> ChLa 331U | Barrio Culture: Art and <br> Literature |
| ChLa 375U | Southwestern Borderlands <br> Eng 309U | 4 |
| Hst 330U | Indigenous Nations Literature <br> Native Americans of Eastern | 4 |
| Hst 331U | North America <br> Native Americans of Western | 4 |
| Hst 349U | North America <br> PS 432 <br> United States Indian Policy <br> Great Tribal Leaders | 4 |
| Psy 410 | Native American Psychological | 4 |
| SW 465 | Healing <br> Native American Psychological <br> Thought and Values | 4 |
| SySc 350U | Introductionto Indian Child <br> Welfare and the Indian Child <br> Welfare Act <br> Indigenous and Systems <br> Perspectives onSustainability | 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 $1.7 \mathrm{C}-$. P/NP grading option are by arrangement only and subject to department approval.

Total Credit Hours: 56

## 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 Epis temologies 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
general education requirements with courses in this area.
The objectiveof the internship requirement is to place
INST students in community orgovernmentorganizations so that each student has an opportunity to acquire understanding of Native issues.

For information and advising, contact the Program Coordinator, JoshPowellat josh@pdx.edu.

## REQUIREMENTS

| Courses |  |  |
| :---: | :---: | :---: |
| NAS 201 | Introductionto Native American Studies | 4 |
| NAS 404 | CooperativeEducation/Internship | 4 |
| Upper-division credit courses chosen from the following (or other adviser-approved courses) 24 credits |  |  |
| Anth 313U | Native American-Settler Relations | 4 |
| Anth 314U | Native Americans | 4 |
| Anth 364U | The Archaeology of the Pacific Northwest | 4 |
| Anth 365U | The Archaeology of North America | 4 |
| Anth 366U | The Archaeology of Mesoamerica | 4 |
| Anth 417 | Advanced Topics in Native American Studies | 4 |
| Anth 422 | Tribal Sovereignty and Policy | 4 |
| Anth 464 | Topics in Northwest Archaeology | 4 |
| Eng 305U | Topics in Film | 4 |
| Eng 309U | Indigenous Nations Literature | 4 |
| Hst 330U | Native Americans of Eastern North America | 4 |
| Hst 331U | Native Americans of Western North America | 4 |
| Hst 349U | United States Indian Policy | 4 |
| Hst 464 | Indians of the Pacific Northwest | 4 |
| NAS 301 | Introduction to Native American Languages | 4 |
| NAS 417 | Maintenance and Revitalization of Endangered Languages | 4 |
| Psy 410 | Native American Psychological Healing | 4 |
| Psy 410 | Native American Psychological Thoughtand Values | 4 |
| Subtotal: 28 |  |  |

Interdisciplinary Studies: Arts and Letters, Liberal Studies, Science, Social Science
503-725-3822
Suite 360 FariborzMaseehFall(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 listed 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 scienceacademic 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.
Outs ide of the requirement that Interdisciplinary Studies and Liberal Studies students take Wr 323 or a Writing Intens ive Course(WIC), there are no specific courses required forthe Interdisciplinary Studies and Liberal Studies majors. To take full advantage of the opportunities afforded these majors, students should plan a program which includes a coherentset of courses providing an indepth study in the area of special interest as well as providing enhancement of problem-solving and communication skills.

## Undergraduate program

For advising in these majors, please go to: https://www.pdx.edu/advis ing/advis ing-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

Admission to the department is based on general admission to the University. See Admis sions Requirements (p. 8) for more information.

ARTS \& LETTERS B.A./B.S.

For a list of courses under the Arts and Letters academic distribution area, review the Requirements website (p.33).

## Courses

| Upper-division credits fromone | 8 |
| :--- | :--- |
| departmentin the major |  |
| academic area |  |
| Upper-division credits froma | 8 |
| second department in the major |  |
| academic area |  |

Additionalupper division credits from any department(s) in the major academic area Additional credits in the major
academic area
Wr 323
Writing as CriticalInquiry
or
WIC course
Courses used to satisfy the major requirements, whether taken at PSU or els ewhere, 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

> Upper-division credits fromthe
> arts and letters, science and/or social science academic distribution areas

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 els ewhere, 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 general education requirement and the upper-division requirement in the academic distribution areas for the second major.

SCIENCE B.A./B.S.

For a list of courses under the Science academic distribution area, review the Requirements website (p.33).

## Courses

| Upper-division credits fromone | 8 |
| :--- | ---: |
| department in the major |  |
| academic area |  |
| Upper-divis ion credits froma <br> second department in the major | 8 |
| academic area |  |
| Additionalupper division credits | 16 |
| from any department(s) in the <br> major academic area |  |


|  | Additional credits in the major <br> academic area | 20 |
| :--- | :--- | ---: |
| Wr 323 | Writing as Critical Inquiry <br> or <br> WIC course | 4 |

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 underthe Social Scienceacademic distribution area, review the Requirements website (p.33).

In addition to meeting all of the non-major and general education baccalaureate degree requirements, a student in one of the above majors must complete 52 credits in one of the following areas: arts and letters or science or social science. A minimum of 32 of the 52 credits must be upperdivision with at least 8 upper-division credits in each of two departments. In addition to 52 credits, all students must take Wr 323 or a Writing Intensivecourse for a total of 56 credits.

## Courses

Wr323 Writing as Critical Inquiry
or
WIC course
academic area
Upper-division credits froma 8 second department in the major academic area
Additional upper division credits
from any department(s) in the major academic area
Additional credits in the major academic area

## Subtotal: 56

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 $P$.

## BILINGUAL TEACHER PATHWAY PROGRAM

The BilingualTeacherPathway programis an initial teacher licensure program designed for bilingual paraprofessionals working in local partner s chool districts. It is currently only available for
paraprofessionals/prospective teachers at the elementary level.
The programconsists of 66-70 credits, includingBTP core courses as well as requirements forthe ESOL endorsement, which are offered in a 2 -year cohort model beginning every fall term. Prior to starting this programat either the undergraduate orgraduate level, students are required to complete MTH 211 , MTH 212, MTH213, and LIB 428 (or an equivalent course in children's literature) with grades ofB-or better, which amounts to at least 15 credits of prerequisites.

For a student to enter this programat the undergraduate level, they are expected to have earned a minimum of 120 credits total, including those prerequisite courses, WR 323 (or another 4-credit upper division writing intensive course), and at least 15 upper divisioncredits in the academic distribution areas of Arts \& Letters, Science, and Social Science, which can include credits from WR 323.
Undergraduate credits can be applied to ward the bachelor's degree in Liberal Studies. www.pdx.edu/ci/btp.

## Judaic Studies

The Harold Schnitzer Family Programin Judaic Studies
Suite 465, University Center Building (UCB)
1881 SW 5th Avenue
Portland, OR 97201-5230
503-725-8449
www.pdx.edu/judaic-studies

- B.A.
- Minor


## Undergraduate programs

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for Judaic Studies' undergraduate degrees, go to www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Admission to the programis based on generaladmis sion to the University. See Admissions 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 SchnitzerFamily 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 major explores topics in history, English literature, Hebrew language, religion, and film studies.

We welcome students of all backgrounds who seek an intens ive 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'll enjoy small classes taught by ourscholar-teachers who foster the kind of close-knit academic community usually as sociated with small liberal arts colleges, all nestled within a major urban university.
- Exciting Opportunities for Study Abroad in Israel: The Lorry I. Lokey Endowed Fund for Israel Scholarship provides up to $\$ 5,000$ annually for a Judaic Studies major to travel to and study abroad in Is rael.
- Funded Internships at LocalCommunity 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
- Analyticalacumen
- 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 | Jewish History from Antiquity to | 4 |
| 317U/Hst | the Medieval Period |  |
| 317 U |  |  |
| 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 | Pagans, Christians and Jews | 4 |

378U/Hst
378U

## Area I: Is rael Studies

| Eng 330U | Jewish and Is raeli Literature | 4 |
| :--- | :--- | :--- |
| JSt 333U | IsraeliCulture and Society | 4 |
| JSt | History of Zionism | 4 |
| 379U/Hst |  |  |
| 379U |  | 4 |
| JSt 388U | History of Modern Israel | 4 |
| JSt 435 | Jewish and Israeli Dance History | 4 |


| Area J: Judaism |  |
| :---: | :---: |
| JSt |  |
| Rabbinic Culture in the Roman |  | 319U/Hst Woid Culture the Roman 319U/Hst World 319 U

JSt 324U Historical Introduction to the Hebrew Bible/Old Testament JSt Kabbalah: The Jewish Mystical 381U/Hst Tradition 381U
Area L: Literature, Culture, and the Arts JSt Rabbinic Culture in the Roman 4
319U/Hst World
319 U
JSt 325U Retelling the Bible 4
Eng 330U Jewish and IsraeliLiterature 4
JSt 333U Is raeliCulture and Society 4
JSt 435 Jewish and Is raeli Dance History 4

| Area M: Modern Jewish History |  |  |
| :--- | :--- | :--- |
| JSt | Jewish History from the | 4 |
| $318 \mathrm{U} / \mathrm{Hst}$ | MedievalPeriod to the Present |  |
| 318 U |  | 4 |
| JSt 335U | Sex, Love, and Gender in Israel | 4 |
| JSt | History of Zionism | 4 |

379U/Hst
379U

| JSt | The Holocaust |
| :--- | :--- |
| 380U/Hst |  |
| 380U |  |
| JSt 388U | History of Modern Israel |

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 201
JSt
317U/Hst
317 U
JSt
318U/Hst
318U
Heb 301
Heb 302
Heb 303
JSt 407

Introduction to Judaism 4
Jewish History from Antiquity to 4 the Medieval Period

Jewish History from the
MedievalPeriod to the Present
Third-Year Modern Hebrew Term 1
Third-Year Modern Hebrew Term 2
Third-Year Modern Hebrew Term 3
Seminar 4
4 credits of JSt 402, JSt 405 or 4
JSt 409
24 credits of upper-division JSt
courses or instructor approved equivalents
4 credits of approvedupper
division subject area credits outside JSt program

Total Credit Hours: 60

## JUDAIC STUDIES MINOR

Portland State University offers a conceptually structured yet flexible undergraduateminor in Judaic Studies. Students completing the minor will have gained exposure to the study of Jewish his tory and culture in a variety of national and international contexts. Students completing the minor are required to take Introduction to Judaismand at least one termof the two-terms equence in Jewish history, as well as coursework dealing with Jews and Judaismin Europe, Is rael, and the United States, the major
historical centers of Jewish life in the modern period. Students are also required to take coursework focusing on Jewish history or culture prior to the modern period (defined as 1700 and earlier). 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, at least 16 credits of which must be upperdivision courses, and at least 12 credits of which must be taken in residence at PSU. These 28 credits must include the following:

| Courses |  | 4 |
| :---: | :--- | ---: |
| JSt 201 | Introduction to Judaism | 42 |
|  | Area electives (see below) | 12 |
|  | Advisor-approved electives (see | 12 |

Subtotal: 28
Area electives mustinclude at least 4 credits of cours ework from the list of electives above (see requirements for the major) focusing on each of the following categories:

Jewish history/culture in the 4
United States
Jewish history/culture in the State 4
of Israel
Jewish history/culture prior to 4
1700
Subtotal: 12

## Approved Electives

Adviser-approved electives may include up to 4 credits of coursework not on the list of approved electives, but which has a conceptual, topical, or methodologicalrelevance to the discipline of Judaic studies. Up to 8 credits of Heb 203 or higher may be applied.
For information about special by-arrangement courses, and for-credit academic internship opportunities with local cultural and community institutions such as the Oregon Jewish Museum, contact the programadviser.

## Fariborz Maseeh Department of Mathematics + Statistics

460 FariborzMaseeh Hall (FMH)
503-725-3621
www.pdx.edu/math/

- B.A., B.S. in Mathematics
- B.S. in Data Science
- Minor in Mathematics
- Minor in Mathematics for Middle School Teachers
- Mathematics for Teaching License Requirements
- Graduate Certificate forMiddle 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 Mathematical Sciences
- 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 and economics, 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 reasoning, and the many surprising results and elegant 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-artsbachelor-science-mathematics and https://www.pdx.edu/math/bachelor-science-data-science.

## ADMISSION REQUIREMENTS

In order to help students plan their programs, the Fariborz Maseeh Departmentof Mathematics and Statistics provides placement assistance and theopportunity 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 departmentaladviser.

## 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 programthat allows students to pursuespecial areas of interest in mathematics. The programis designed to provide a foundation formore advanced work and/or a bas is for employment 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 | Calculus I | 4 |
| Mth 252 | Calculus II | 4 |
| Mth 253 | Calculus III | 4 |
| Mth 261 | Introduction to Linear Algebra | 4 |
| Mth 254 | Calculus IV | 4 |
| Mth 255 | Calculus V | 4 |
| Mth 256 | Applied Ordinary Differential Equations | 4 |
| Mth 271 | Mathematical Computing or | 4 |
| CS 161 | Introduction to Programming and Problem-Solving | 4 |
| Mth 311 | Introductionto Mathematical Analysis I | 4 |
| Mth 312 | Introductionto Mathematical Analysis II | 4 |
| Mth 344 | Introductionto Group Theory and Applications | 4 |
| Additional Requirements chosen from Approved List of courses-sequences |  |  |
| Mth/Stat (one) | Approved two-term400-level Mth or Stat sequence | 6 |
| Mth/Stat (two) | Approved 400-level Mth or Stat courses | 6-7 |
| Mth/Stat (two) | Approved 300- or 400-level Mth or Stat courses | 6-8 |

Total Credit Hours: 62-65

| Approved electives are: |  |  |
| :---: | :---: | :---: |
| Mth 300 | Introduction to Mathematical | 4 |
|  | Reasoning |  |
| Mth 313 | Advanced Multivariate Calculus | 4 |
| Mth 322 | Applied Partial Differential | 4 |
|  | Equations |  |
| Mth 324 | Vector Analys is |  |
| Mth 338 | Modern College Geometry | 4 |
| Mth 343 | Applied Linear Algebra | 4 |
| Mth 345 | Introduction to Ring and Field | 4 |
|  | Theory |  |
| Mth 346 | Number Theory | 4 |
| Mth 356 | Discrete Mathematics | 4 |
| Mth 371 | Large-Scale Data Algorithms | 4 |
| Mth 411 | Introduction to Real Analysis I | 3 |
| Mth 412 | Introductionto Real Analysis II | 3 |
| Mth 413 | Introductionto Real Analysis III | 3 |
| Mth 420 | Introduction to Complexity Theory | 3 |
| Mth 421 | Theory of Ordinary Differential Equations I | 3 |
| Mth 422 | Theory of Ordinary Differential Equations II | 3 |
| Mth 423 | Theory of Ordinary Differential Equations III | 3 |
| Mth 424 | Elementary Differential Geometry I | 3 |
| Mth 425 | Elementary Differential Geometry II | 3 |
| Mth 427 | Partial DifferentialEquations I | 3 |
| Mth 428 | Partial DifferentialEquations II | 3 |
| Mth 430 | Topics in Mathematical | 3 |
|  | Modeling |  |
| Mth 431 | Topics in Geometry I | 3 |
| Mth 432 | Topics in Geometry II | 3 |
| Mth 433 | Topics in Geometry 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 | Introductionto Abstract Algebra | 3 |
|  | I |  |
| Mth 442 | Introduction to Abstract Algebra II | 3 |
| Mth 443 | Introductionto Abstract Algebra | 3 |
|  | III |  |
| Mth 444 | Advanced Linear/Multilinear | 3 |
|  | Algebra I |  |
| Mth 445 | Advanced Linear/Multilinear | 3 |
|  | Algebra II |  |
| Mth 449 | Topics in Advanced Number | 3 |
|  | Theory |  |
| Mth 451 | Numerical Calculus I | 3 |
| Mth 452 | Numerical Calculus II | 3 |
| Mth 453 | Numerical Calculus III | 3 |
| Mth 456 | Topics in Combinatorics | 3 |

Mth 457

Mth 458

Mth 461
Mth 462
Mth 464
Mth 465
Mth 470
Mth 471

Mth 472

Mth 477
Mth 478
Mth 481
Mth 482

Mth 483

Mth 484

Mth 485

Mth 486

Mth 487

Mth 488

Stat 361

Stat 363

Stat 364
Stat 387

Stat 451

Stat 452

Stat 461

Stat 462

Stat 463

Stat 464
Stat 465

Stat 466

Stat 467

The MathematicalTheory of 3 Games I
The MathematicalTheory of Games II
Graph Theory I
Graph Theory II 3
Numerical Optimization I
Numerical Optimization II
Complex Analysis and Boundary
Value Problems I
Complex Analysis and Boundary
Value Problems II
Complex Analysis and Boundary
Value Problems III
Mathematical Control Theory I
Mathematical Control Theory II
Topics in Probability for
Mathematics Teachers
Topics in Statistics for
Mathematics Teachers
Topics in Geometry for
Mathematics Teachers
Topics in Algebrafor
Mathematics Teachers
Topics in Analysis for
Mathematics Teachers
Topics in The History of
Mathematics
Topics in Discrete Mathematics
for Mathematics Teachers
Topics in Computing for
Mathematics Teachers
Introductionto Statistical
Methods
Statistical Computing and Data
Visualization in R
Modern Regression Analysis
Introductionto Statistical
Learning
Applied Statistics for Engineers
and Scientists I
Applied Statistics for Engineers and Scientists II
Introduction to Mathematical
Statistics I
Introduction to Mathematical
Statistics II
Introduction to Mathematical
Statistics III
Applied Regression Analysis
Experimental Design: Theory
and Methods I
Experimental Design: Theory
and Methods II
Applied Probability I
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 satis fy the mathematicalmajor requirements, whether taken in the department or els ewhere, must be graded C-, 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 statistics courses in residence.

## M ATHEMATICS B.A./B.S. OPTIONS

In addition to the specific required courses (p.282), the following options are intended to help the student plan a programofstudy with a specific goal or career in mind.
Option I-Applied Mathematics
Recommended electives:
Mth $322 \underset{\text { Equations }}{\text { Applied Partial Differential }}$
Mth 343 Applied Linear Algebra
Mth 371 Large-Scale Data Algorithms
Mth 421 Theory of Ordinary Differential
Equations I
Mth 422 Theory of Ordinary Differential Equations II
Mth 424 Elementary Differential Geometry I
Mth 425 Elementary Differential Geometry II
Mth $427 \quad$ Partial DifferentialEquations I
Mth $428 \quad$ Partial DifferentialEquations II
Mth 430 Topics in Mathematical Modeling
Mth $451 \quad$ Numerical Calculus I
Mth 452 Numerical Calculus II
Mth $457 \quad$ The Mathematical Theory of Games I
Mth 458 The Mathematical Theory of Games II
Mth 464 Numerical Optimization I
Mth 465 Numerical Optimization II 3
Mth $470 \quad$ Complex Analysis and Boundary
Mth 477 Mathematical ControlTheory I 3
Mth 478 Mathematical ControlTheory II
Option II-Graduate School Preparation
Recommended electives:
Mth 411
Introduction to Real Analysis I
Mth 412 Introduction to Real Analysis II
Mth 413 Introduction to Real Analysis III

| 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 | 3 |
|  | I |  |
| Mth 442 | Introduction to Abstract Algebra | 3 |
|  | II | 3 |
| Mth 443 | Introduction to Abstract Algebra | 3 |
|  | III |  |
| Option III—Statistics |  |  |
| Recommended electives: |  |  |

Stat 361 Introductionto Statistical 4
Stat 363 StatisticalComputing and Data 4
Visualization in R
Stat $364 \quad$ Modern Regression Analysis 4
Stat 387 Introductionto Statistical 4
Stat 461 Introduction to Mathematical 3
Statistics I
Stat 462 Introduction to Mathematical 3
Statistics II
Stat 463 Introduction to Mathematical 3
Statistics III
Stat 464 Applied Regression Analysis
Stat 465 Experimental Design: Theory and Methods I
Stat 466 Experimental Design: Theory and Methods II
Stat 467 Applied Probability I
Stat 468 Applied Probability II
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 3
Mathematics
Mth 488 Topics in Computing for
Mathematics Teachers
Introduction to Mathematical 3
Statistics I
Stat 462 Introduction to Mathematical
Statistics II
See also the Mathematics Licensure section.
Option V—Actuarial Science
Recommended electives:
Mth 271
Mathematical Computing
Mth $451 \quad$ Numerical Calculus I 3
Mth $452 \quad 3$
Stat 451 Applied Statistics for Engineers

| Stat 461 | Introduction to Mathematical Statistics I |
| :---: | :---: |
| Stat 462 | Introductionto Mathematical |
|  | Statistics II |
| Stat 463 | Introductionto Mathematical |
|  | Statistics III |
| Stat 464 | Applied Regression Analysis |
| Stat 465 | Experimental Design:Theory and Methods I |
| Stat 466 | Experimental Design:Theory and Methods II |
| Stat 467 | Applied Probability I |
| Stat 468 | Applied Probability II |

## M ATHEMATICS 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 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 FariborzMaseeh 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 Maseeh Department of Mathematics and Statistics no later than three quarters before graduation.

## Requirements

The Mathematics and Statistics Honors Track requirements for graduation are:

## Courses

Mth 251

> Calculus I

Mth 252
Calculus II
Mth 253
Calculus III
Mth 254
Mth 255
Mth 261
Mth 256
Calculus IV

Mth 311
Ordinary Applied Ordinary Differential Equations
Mth 311 Introduction to Mathematical Analysis I
Mth 312
Mth 344 Analysis II Introductionto Group Theory and Applications
Mth 401
Honors Project

| Mth 271 | Mathematical Computing <br> or | 4 |
| :--- | :--- | :--- |
| CS 161 | Introductionto Programming and | 4 |
|  | 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 chair of the FariborzMaseehDepartmentof Mathematics and Statistics, in consultation with faculty, will assign the students a faculty honors project adviser to guide their research. The research topic will be at a 400level or above and will not have been 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. Transferstudents majoring in mathematics are required to take a minimum of 15 credits of PSU upper-division mathematics or statistics courses in residence.

The chair and an undergraduate advis er 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 unsatisfactory 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).

## Univers ity 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 register for Hon 403: Thes is Prospectus (4 credits) in the quarter immediately preceding theMth 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 reg istered 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 regis ter for Hon

403: Thes is 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 symposium for Univers ity Honors College faculty and students. Students earn both Mathematics Departmental Honors and University Honors.
Option 2: Univers ity Honors College students who do not meet the minimum requirements or who choose not to jo in the Mathematics Departmental Honors Track program must still fulfill the requirements of two approved 400 levelsequences in mathematics and/or statistics. They are then eligible to proceed with the math 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 DepartmentalHonors. 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 pursuespecial areas of interest in applications of data science. The programis designed to provide a foundation 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
Mth 251
Mth 252
Calculus I
Mth 253
Mth 261
Calculus II
Calculus III
Introduction to Linear Algebra
Mth 271 Mathematical Computing
CS 161 Introductionto Programming and Problem-Solving

Mth 343
Applied Linear Algebra
Mth 371
Large-Scale Data Algorithms
Stat 361
Introductionto Statistical Methods
Stat 363 StatisticalComputing andData
Visualization in R
Stat 364 Modern Regression Analysis
Stat 387 Introduction to Statistical
Learning

| Stat 409 | Data Science Practicum | 3 |
| :--- | :--- | :--- |
| CS 250 | Discrete Structures I | 4 |
| CS 350 | Algorithms and Complexity | 4 |
| CS 486 | Introductionto Database | 4 |
|  | Management Systems |  |

Additional requirements chosen from approved list of electives

| Mth/Stat <br> (two) | Approved400-level Mth or Stat <br> courses | $6-7$ |
| :--- | :--- | :--- |
| Other(two) | Approved 300- or 400-level <br> courses | $6-8$ |

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 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 Systems and Analytic Fundamentals | 4 |
| Comm | Ethics of Human | 4 |
| 389 U | Communication |  |
| CS 430P | Internet, Web, \& Cloud Systems | 4 |
| CS 441 | Artificial Intelligence | 4 |
| CS 445 | Machine Learning | 4 |
| G 324 | Data Management and Analysis | 5 |
| GSCM 412 | Introduction to Enterprise | 4 |
|  | Resource Planning Systems |  |
| ISQA 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 |

## Total Credit Hours: 73-76

All courses used to satis fy the data science major requirements, whether taken in the department or els where, must be graded C-, 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 statistics courses in residence.

## 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 Calculus II 4
Mth 253 Calculus III 4
Mth 261 Introduction to Linear Algebra 4
Mth 254 Calculus IV 4
Mth 311 Introductionto Mathematical 4 Analysis I
or
Mth 344 Introductionto Group Theory and Applications
Additional Requirements chosen from Approved List of courses-sequences

| Mth/Stat |
| :--- |
| (three) | Approvedelective courses $\quad 9-12$

Total Credit Hours: 33-36
Approved electives for the Minor in Mathematics are:
Mth 255 Calculus V
Mth 256 Applied Ordinary Differential
Mth 311 Introductionto Mathematical Analysis I
Mth 312 Introductionto Mathematical Analysis II
Mth 344 Introduction to Group Theory 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 C-, P , or above count toward satis fying the departmentminor 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 ofthese 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 | 4 |
|  | Mathematics II |  |
| Mth 213 | Foundations OfElementary | 4 |
|  | Mathematics III |  |
| Mth 491 | Experimental Probability and Statistics for Middle School | 4 |
|  | Teachers |  |
| Mth 493 | Geometry for Middle School | 4 |
|  | Teachers |  |
| Mth 494 | Arithmetic and Algebraic | 4 |
|  | Structures for Middle School |  |
|  | Teachers |  |
| Mth 495 | Historical Topics in Mathematics for Middle School Teachers | 4 |
| Mth 496 | Concepts ofCalculus for Middle | 4 |
|  | School Teachers |  |
| Mth 497 | Mathematics in the Middle | 4 |
|  | SchoolClassroom |  |

## Total Credit Hours: 36

Only grades of $\mathrm{C}-\mathrm{P}$, or above count toward satis fying the departmentminor requirements. No more than three courses with a grade of P may be counted to ward these requirements.

## 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. 146) through the College of Education.

Below is a list of the minimal mathematics/statistics cours ework required for individuals needing a Departmental Recommendation to enter the Graduate TeacherEducation Program(GTEP) in Advanced Mathematics and in Foundational Mathematics. GTEP is a programin the College of Education, but these mathematics/statistics prerequisites are taken in the
FariborzMaseeh Department of Mathematics and
Statistics. A bachelor's degree is also required by GTEP,
although not necessarily in mathematics. One may apply
for the GTEP programbefore completing all coursework,
but coursework must be completed before entrance to
GTEP.

## SECONDARY EDUCATION PROGRAM REQUIREMENTS FOR THE ADVANCED M ATHEMATICS

The programmust includethe 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 | Introductionto Linear Algebra | 4 |
| Mth 271 | Mathematical Computing | 4 |


| CS $161 \quad$ | Introduction to Programming and |
| :--- | :--- | :--- |
| Problem-Solving |  |

Mth 338 Modern College Geometry 4
Mth 344 Introductionto Group Theory 4
Mth 346 NumberTheory 4
Mth 356 Discrete Mathematics 4
Mth 481 Topics in Probability for 3
Mathematics Teachers
or
Mth 482 Topics in Statistics for 3
Mathematics Teachers
or
Stat 451 Applied Statistics for Engineers
and Scientists I
or
Stat 461 Introduction to Mathematical
Statistics I
or
Stat 462 Introduction to Mathematical
Statistics II

## Electives

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

Mth 482

Stat 452

Mth 483
Mth 484
Mth 486
Mth 487

Mth 488

Topics in Probability for Mathematics Teachers or
Topics in Statistics for Mathematics Teachers or Applied Statistics for Engineers and Scientists II

Topics in Geometry for
Mathematics Teachers
Topics in Algebra for
Mathematics Teachers
Topics in The History of
Mathematics
Topics in Discrete Mathematics
for Mathematics Teachers
Topics in Computing for
Mathematics Teachers

## PROGRAM REQUIREMENTS FOR THE <br> 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
Foundations Of Elementary
Mathematics II
Mth 213
Foundations Of Elementary
Mathematics III
Experimental Probability and
Statistics for Middle School
Teachers
Mth 493
Mth 494
Geometry for Middle School
Teachers
,
Structures for Middle School Teachers
Mth 495 Historical Topics in Mathematics
for Middle School Teachers
Concepts of Calculus for Middle
SchoolTeachers
Mth 497
Mathematics in the Middle
SchoolClassroom

## 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 must meet 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 -cred it program that includes at least 30 credits in mathematics or statistics. Students shall selecteither Option A or OptionB.

Option A: The studentmust 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, 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 als o show proficiency in a second language.

A student must have a minimum 3.00 GPA on the courses applied to the programofstudy, 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 admis sion to the graduate program. All cours es 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 the PSUBulletin. Several of the most frequently asked aboutUniversity-level graduate policies and procedures can also be found on the Graduate School website.

## Approved cours es for the degree:

Mth 511
Introduction to Real Analysis I
Mth 512 Introduction to Real Analysis II
Mth 513 Introduction to Real Analysis III
Mth 521 Theory of Ordinary Differential Equations I

Mth 522

Mth 523
Mth 524
Mth 525

Mth 527
Mth 528
Mth 530

Mth 531
Mth 532
Mth 533
Mth 534
Mth 535
Mth 536
Mth 541

Mth 542
Mth 543

Mth 544

Mth 545
Mth 549
Mth 551
Mth 552
Theory of Ordinary Differential
Equations II
Theory of Ordinary Differential Equations III
Elementary Differential Geometry I
Elementary Differential Geometry II Partial Differential Equations I Partial Differential Equations II
Topics in Mathematical Modeling
Topics in Geometry I
Topics in Geometry II
Topics in Geometry III
Set Theory and Topology I
Set Theory and Topology II
Set Theory and Topology III
Introduction to Abstract Algebra I

Introduction to Abstract Algebra II
Introduction to Abstract Algebra III
Advanced Linear/Multilinear Algebra I
Advanced Linear/Multilinear Algebra II
Topics in Advanced Number
Theory
Numerical Calculus I

| Mth 553 | Numerical Calculus III | 3 |
| :---: | :---: | :---: |
| Mth 556 | Topics in Combinatorics | 3 |
| Mth 557 | The Mathematical Theory of Games I | 3 |
| Mth 558 | The Mathematical Theory of Games II | 3 |
| Mth 561 | Graph Theory I | 3 |
| Mth 562 | Graph Theory II | 3 |
| Mth 564 | Numerical Optimization I | 3 |
| Mth 565 | Numerical Optimization II | 3 |
| Mth 570 | Complex Analysis and Boundary Value Problems I | 3 |
| Mth 571 | Complex Analysis and Boundary Value Problems II | 3 |
| Mth 572 | Complex Analysis and Boundary Value Problems III | 3 |
| Mth 577 | Mathematical ControlTheory I | 3 |
| Mth 578 | Mathematical ControlTheory II | 3 |
| Mth 611 | Theory of Functions of Real Variable I | 3 |
| Mth 612 | Theory of Functions of Real Variable II | 3 |
| Mth 613 | Theory of Functions of Real Variable III | 3 |
| Mth 614 | Modern Analysis I | 3 |
| Mth 615 | Modern Analysis II | 3 |
| Mth 616 | Modern Analysis III | 3 |
| Mth 617 | Functional Analysis I | 3 |
| Mth 618 | Functional Analysis II | 3 |
| Mth 619 | Functional Analysis III | 3 |
| Mth 621 | Advanced Differential Equations I | 3 |
| Mth 622 | Advanced Differential Equations II | 3 |
| Mth 623 | Advanced Differential Equations III | 3 |
| Mth 624 | Advanced Differential Geometry I | 3 |
| Mth 625 | Advanced Differential Geometry II | 3 |
| Mth 626 | Advanced Differential Geometry III | 3 |
| Mth 634 | Algebraic Topology I | 3 |
| Mth 635 | Algebraic Topology II | 3 |
| Mth 636 | Algebraic Topology III | 3 |
| Mth 637 | Geometric Topology I | 3 |
| Mth 638 | Geometric Topology II | 3 |
| Mth 639 | Geometric Topology III | 3 |
| Mth 641 | Modern Algebra I | 3 |
| Mth 642 | Modern Algebra II | 3 |
| Mth 643 | Modern Algebra III | 3 |
| Mth 651 | Advanced Numerical Analysis I | 3 |
| Mth 652 | Advanced Numerical Analysis II | 3 |
| Mth 653 | Advanced Numerical Analysis III | 3 |
| Mth 661 | Algebraic Graph Theory I | 3 |


| Mth 662 | Algebraic Graph Theory II | 3 |
| :---: | :---: | :---: |
| Mth 663 | Algebraic Graph Theory III | 3 |
| Mth 667 | Stochastic Processes and | 3 |
|  | Probability Theory I |  |
| 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 Linear Models II | 3 |
| Stat 666 | Theory of Linear Models III | 3 |
| Check with including approved f is approve credit hou | programadviser for additional co bus-numbered courses, which als A/MS programs. "Approved" me ward fulfilling the 30 mathematics the MA/MS Math program. | be hat it stics |
| Approved | tives for the degree: |  |
| Mth 581 | Topics in Probability for | 2-3 |
|  | Mathematics Teachers |  |
| Mth 582 | Topics in Statistics for | 2-3 |
|  | Mathematics Teachers |  |
| Mth 583 | Topics in Geometry for | 2-3 |
|  | Mathematics Teachers |  |
| Mth 584 | Topics in Algebra for | 2-3 |
|  | Mathematics Teachers |  |
| Mth 585 | Topics in Analysis for | 2-3 |
|  | Mathematics Teachers |  |
| Mth 586 | Topics in The History of | 2-3 |
|  | Mathematics |  |
| Mth 587 | Topics in Discrete Mathematics | 2-3 |
|  | for Mathematics Teachers |  |
| Mth 588 | Topics in Computing for | 1-3 |
|  | Mathematics Teachers |  |
| "Approved as elective" means that it is approved ins ide the 45 total credit hours but not inside the 30 mathematics/statistics credit hours. Check with the programadviser for additional ap proved electives. |  |  |
| M AMS EXAM INATIONS |  |  |

Depending on the option chosen, students must pass one or two Master's exams.

Option A: Student must pass one written examination in either Algebra or Analysis.

Option B: Studentmust pass two written examinations, one of which must be in either Algebra or 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 seethe full MS Exam Policy (https://www.pdx.edu/math/ms-exam-policy).

## M TH 501 MATHEMATICAL LITERATURE AND PROBLEMS

In this 3-credit course, a student works under the supervision of a faculty member in an area ofmathematics 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/MS MATHEMATICS DEGREE PROGRAM

The department offers courses in pure and applied mathematics and in statistics. Students may choose an emphasis in one ormore of these areas. The Course Projection Guide (CPG: https://app.banner.pdx.edu/cpg/) lists the projected future $600-l e v e l$ cours eofferings. These projections enable students to plan programs that include any necessary 500 -level prerequisites. Students also need to plan programs that will prepare them to 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 or entry 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 ofstatistical methods.

## ADMISSION

## 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 to PSU'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 33 core credits in courses with the Stat prefix. In addition, students must pass two examinations, one in Mathematical Statistics and one in Applied Statistics.

A student must have a minimum 3.00 GPA on the courses applied to the programofstudy, 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 to ward 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 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.

## CORE REQUIREMENTS (33 CREDITS)

The 33 core credits must include courses distributed as follows:
Two 9-credit sequences:
Stat 561 Mathematical Statistics I 3
Stat $562 \quad$ Mathematical Statistics II 3
Stat 563 Mathematical Statistics III 3
Stat 564 Applied Regression Analysis 3
Stat 565 Experimental Design: Theory 3
and Methods I
Stat 566 Experimental Design: Theory

| Topics in Statistical Cons ulting (3 credits) |  |  |
| :---: | :---: | :---: |
| Stat 570 | Statistical Consulting | 1-3 |
| Stat 570 is currently offered during Spring termonly. |  |  |
| STAT 501 Statistical literature and problems (3 credits) |  |  |
| Stat 501 | Research | 1-6 |
| One 9-credit sequence chosen from |  |  |
| Stat 661 | Advanced Mathematical Statistics I | 3 |
| Stat 662 | Advanced Mathematical Statistics II | 3 |
| Stat 663 | Advanced Mathematical Statistics III or | 3 |
| Stat 664 | Theory of Linear Models I | 3 |
| Stat 665 | Theory of Linear Models II | 3 |
| Stat 666 | Theory of Linear Models III | 3 |
|  | or |  |
| Mth 667 | Stochastic Processes and Probability Theory I | 3 |
| Mth 668 | Stochastic Processes and Probability Theory II | 3 |
| Mth 669 | Stochastic Processes and Probability Theory III or | 3 |
| Stat 671 | StatisticalLearning I | 3 |
| Stat 672 | Statistical Learning II | 3 |
| Stat 673 | StatisticalLearning III | 3 |
| ELECTIVES (12 CREDITS) |  |  |
| A total of 12 elective credit hours must be completed. The following list of courses is pre-approved forelectivecredit |  |  |
| Stat 571 | Applied Multivariate Statistical Analysis | 3 |
| Stat 572 | Bayesian Statistics | 3 |
| Stat 573 | Computer Intensive Methods in Statistics | 3 |
| Stat 576 | Sampling Theory and Methods | 3 |
| Stat 577 | CategoricalData Analysis | 4 |
| Stat 578 | Survival Analysis | 3 |
| Stat 580 | Nonparametric Methods | 3 |
| Stat 661 | Advanced Mathematical Statistics I | 3 |
| 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 <br> Probability Theory I | 3 |
| :--- | :--- | :--- |
| Mth 668 | Stochastic Processes and <br> Probability Theory II | 3 |
| Mth 669 | Stochastic Processes and <br>  <br> Stat 671 | Probability Theory III |
| Statistical Learning I | 3 |  |
| Stat 673 | Statistical Learning II | 3 |
| CS 545 | Statistical Learning III | 3 |
| Ec 572 | Machine Learning | 3 |
| USP 655 | Time Series Analysis and <br> Forecasts <br> Advanced Data Analysis: | 3 |
|  | Structural Equation Modeling | 4 |
| Psy 526 | Multilevel Regression | 3 |

Otherstatistically oriented courses outside the Department and other mathematics courses may be substituted, but must be approved as electives by the statistics graduate programadviser. "Approved as elective" means that it is approved inside the 12 elective credit hours but not inside the 33 statistical credit hour core requirements. A course or sequence cannot be counted both within the 33-hour core and as an elective course or sequence.

## MS EXAMINATIONS

Students must pass two examinations, one in Mathematical Statistics which covers Stat 561, Stat 562, Stat 563 and one in Applied Statistics 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 graduate credit 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 ) or Fail ( F ) is given on each component.

- Two P's equala 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 required 3 credit course for the MS in Statistics, a student works under the supervision of 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 courseare contained in the handout: Guidelines and Deadlines for Stat 501 StatisticalLiterature and Problems.

## PLANNING AN MS DEGREE PROGRAM

The Course Projection Guide (CPG, https://app.banner.pdx.edu/cpg/) lists the projected future 600 -level course offerings. These projections enable students to plan programs that include any necessary 500levelprerequisites. Students als o need to plan a program that will prepare themto pass the two MS examinations. Students entering the program with core courses Stat561, Stat 562, Stat 563 and Stat 564, Stat 565, Stat 566 successfully completed and considering future purs uit of the Ph.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 programadvis er 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 specialized courses for secondary school teachers ofmathematics. TheMS-MTCH does not lead to a teaching license. If you are interested in teaching secondary mathematics, please contact the School of Education, GTEP program.

## ADMISSION

## Programprerequisites:

Transcript(s) must show satisfactory 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 discrete mathematics are recommended.
In addition to programprerequisites, applicants must meet 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:

An MS-MTCH candidate must complete an approved programof45 graduate credits which includes a mathematics curriculumproject.

A student must have a minimum 3.00 GPA on the courses applied to the programofstudy, 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 admis sion 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 cours ework

Probability/Statistics (6 credits)
Mth 581 Topics in Probability for 2-3
Mathematics Teachers
Mth 582 Topics in Statistics for
Mathematics Teachers
Geometry (3 credits)
Mth 583 Topics in Geometry for
Mathematics Teachers

## Algebra (3 credits)

Mth 584 Topics in Algebra for
2-3

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 Mathematics | 2-3 |
| Discrete Math (3 credits) |  |  |
| Mth 587 | Topics in Discrete Mathematics for Mathematics Teachers | 2-3 |
| Computing ( $\mathbf{3}$ credits) |  |  |
| Mth 588 | Topics in Computing for Mathematics Teachers | 1-3 |
|  | (3 credits) |  |

Mth 589 Topics in Mathematical
Exposition and Curriculum Development
or
Approved graduate mathematics
education course

## Curriculum Project (3 credits)

$\begin{array}{cl}\text { Mth } 501 \quad \text { Curriculum Research, } \\ & \text { Mathematics }\end{array}$
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 from the MS-MTCH programadviser. Notealso 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.

## M TH 501 MATHEMATICS CURRICULUM PROJECT

As part of the degree requirements, the student will complete a mathematics curriculumproject. In this independent research project, the student will explore a mathematical topic and will develop and classroom-test curriculummaterials related to that topic. Under the guidanceofa 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 for Teachers' CurriculumProjects.

## Planning a MS-MTCH Degree Program:

Many of the courses are offered on a three-year cycle. Refer to the Cours e 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 Math Curriculum Project early in your program. It generally takes at least three terms to narrow in on a topic, choose a 501 adviser, puta project committee together, do the background research, develop the materials and test them with 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 Issues in Your MS in Mathematics for Teachers Program.

MATHEMATICAL SCIENCES PH.D.
The Ph.D in Mathematical Sciences at Portland State Univers ity 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 advis ing support. MathematicalSciences at PSU encompass a wide range of specialties as can be seen from our faculty profiles webpage. Traditionally at PSU, students often engage in multidisciplinary research work and take graduate courses in other departments. The programprepares for academic professions as well as a broad rangeofnon 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, Mathematical Sciences allow to answer 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 adv ising support.
The programaccommodates a broad range of interdisciplinary partners. Students choose a main concentration within the MathematicalSciences as well as a secondary concentration. This secondary concentration can be chosen within the Mathematical Sciences or alternatively, with in 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. program will 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 undertakestudy 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 thePSU Bulletin.

## I. Planning a Ph.D. in Mathematical Science Program:

Upon admiss ion to the programthe student will be assigned an academic adviser providing support for the student's exam schedule and programof courses. After satis factory 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 leveloffered 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.

Dissertation (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: Theseexams are intended to verify that the studenthas the prerequisites for high-level mathematical courses and also to verify that the student has the bas ic capabilities and interest in mathematical res earch. This examination consists of two Master's level written examinations offered in the FariborzMaseeh 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 engage early-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 from the examining committee a grade of unconditional pass, conditional pass (with conditions specified by the examining committee), or fail. A (strict) majority of votes in favorof either pass or conditional pass is needed for the student notto fail the exam. The candidate is allowed to stand for this examat most twice, and must pass th is examwithin five years after entering the programto continue.

## IV. Dis sertation:

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 res earch 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 dissertation committee must also satisfy the rules dictated by the Graduate School.

## V. Advancement to Candidacy:

W ith guidance from the dis sertation committee, the student will prepare a thesis proposal and presentation. The goal of this presentation is to inform the committee of the intent of the dissertation 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 FariborzMaseeh 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 pecialis ts in mathematics, supervisors of mathematics at the middle school level orsecondary school level, or mathematics specialists in stateor localdepartments of education; (iii) Private sector specialists 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 must meet the university's minimumadmis sion 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 program of 84 credit hours consisting of three major components: coursework, a research practicumexperience, and dissertation research.

## Cours ework 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 outs ideofmathematics (such as curriculumand instruction, psychology, educational policy, science, computer science, philosophy, sociology, anthropology, etc.)


## Res earch Practicum Mth 601 ( 3 credits)

The purpose of the res earch experience will be to provide candidates with an opportunity to use methodological techniques in mathematics education early on in their course of study. Prior to the dis sertation, 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.

## Dissertation Research Mth 603 ( 27 credits)

The $\mathrm{Ph} . \mathrm{D}$. dissertation 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 ofresearch in mathematics education. Dis sertation committees consisting of a mix of faculty with expertise in mathematics education, mathematics, curriculum and 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 proposalhas been approved by the committee, and if necessary 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 dissertation credit during each term they are eng aged in dis sertation 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 problem chosen for research, and to show how the dissertation contributes to work in this area.

## Demons trated competency areas:

Prior to completing their program, candidates in the Mathematics Education Ph.D. program will be expected to demonstrate competency 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 passing a written, comprehensive exam.
Coursework: Candidates must successfully complete the 6 graduate seminars in Mathematics Education (Mth 690, 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, comprehensive exam that covers the key developments and theoretical perspectives on the history of mathematics education, the teaching and learning of mathematics, and the development of curriculum in 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 $\mathrm{Ph} . \mathrm{D}$. in Mathematics Education are expected to have at least master's degree in mathematics or a degree equivalent to the MS-MTCH (p.293) degree at Portland State University. The competency in mathematics can be met by successfully completing additional graduatelevel cours ework in mathematics beyond the masters and by passing a written comprehensive exam.

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 abstractalgebra, 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 analysis, 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 coherentsupporting 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 demonstrate 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 eitherby working with students in K-12 classrooms or by teaching courses in the department that utilize technology (e.g., precalculus, calculus, linear algebra, ordifferential equations). 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 FariborzMaseeh 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 (Cabrigeometry, Geometer's Sketchpad). In addition students are introduced to the various mathematics res ources and information available on the W orld Wide W eb. 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. programwill be expected to demonstrate competency in working with urban populations and settings either by providing serviceor 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 fromoutsideareas.

## Residency

In a doctoral program, the residency requirement can be satis fied in one of the follow ways:

- Three terms offull-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 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 program provides 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 division 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 admission 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 ofCurriculumand 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 mustmeet the university's minimumadmission 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 Univers ity then see this page for admission 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 Requestfor 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 students.
- Is geared to the special characteris tics of the student population of an urban university, and takes advantage of the varied resources found in an urbansetting.
- Models a philosophy ofteaching 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 theMathematical 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 them to teach mathematics in middle school classrooms. 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) mathematicalunderstanding 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 REQUIREMENTS

The certificate programconsists of the following six (6) mathematics courses totaling 24 credits.

## Courses

Mth $591 \quad \begin{aligned} & \text { Experimental Probability and } \\ & \text { Statistics for Middle }\end{aligned}$ Statistics for Middle School Teachers
Mth 593 Geometry for Middle School
Mth 594 Arithmetic and Algebraic Structures for Middle School Teachers
Mth 595 Historical Topics in Mathematics
for Middle SchoolTeachers
Mth 596 Concepts of Calculus for Middle
Mth 597 Mathematics in the Middle

Succes sful completion ofthe 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 thetermprior to the termof anticipated graduation to confirm that all program requirements have been completed. Instructions for applying to graduate as wellas 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 ofthePSU 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 designed to provide a companion credential forstudents in other graduate programs (including Mathematics) who have demonstrated expertise in methods and techniques for the quantitative analysis and modeling ofdata. 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 Environmental Engineering, Economics, Electrical and Computer Engineering, ComputerScience, Engineering and Technology Management, Environmental Sciences and Resources, MechanicalEngineering, Political Sciences, Sociology, Urban Studies, Systems Science. However, the GCAS
programequally serves those who want to pursue just the graduate certificate.

## ADMISSION:

## Programprerequisites:

Prospectivestudents 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 bas ic statistical methodology is as sumed. Prerequisites for the GCAS are: 3 terms of Calculus (Mth 251-253), Linear Algebra (Mth 261), and a statisticalmethods 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 admiss ion 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 Univers ity, see this page for admission instructions: https://www.pdx.edu/math/graduate-applicationinstructions. If you are currently a graduatestudent 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 res earch methods component that requires thestudent to acquire some exposure to statistical methods as the basis for the design of experiments and analysis of data. TheGraduate 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 res earch 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 cours ework 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 programofstudy, 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 programofstudy 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 provideexperience 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 - or better grade. To continue in the program, students are required to maintain regular graduate studentstatus, requiring a cumulative 3.00 GPA for all cours ework and a term GPA of at least 2.67.

## Theory courses

$\begin{array}{ll}\text { Mth } 667 & \text { Stochastic Processes } \\ & \text { Probability Theory I }\end{array}$
Mth 668 Stochastic Processes and 3
Mth 669 Stochastic Processes and 3
Stat $561 \quad$ Mathematical Statistics I 3
Stat 562 Mathematical Statistics II 3
Stat 563 Mathematical Statistics III 3

| Stat 661 | Advanced Mathematical Statistics I | 3 |
| :---: | :---: | :---: |
| 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 Linear Models II | 3 |
| Stat 666 | Theory of Linear Models III | 3 |
| Stat 671 | StatisticalLearning I | 3 |
| Stat 672 | Statistical Learning II | 3 |
| Stat 673 | Statistical Learning III | 3 |
| Additional | lied statistics interdis ciplinary cour |  |
| list: |  |  |
| CE | Environmental Data Analysis | 4 |
| 566/ESM |  |  |
| 566 |  |  |
| CS 545 | Machine Learning | 3 |
| Ec 572 | Time Series Analysis and | 4 |
|  | Forecasts |  |
| Ec 575 | Applied Advanced Econometrics | 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 | Research Design in Applied | 4 |
|  | Psychology |  |
| Soc 593 | 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 Analysis | 3 |
| Stat 572 | 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 | Survival Analysis | 3 |
| Stat 580 | Nonparametric Methods | 3 |
| USP 532 | Data Collection | 4 |

Please contact the programadvis er during the term prior to the anticipated graduationterm to confirm that all program requirements have been completed. Instructions for graduation application and deadlines can be found on the Graduate School's website.

## Philosophy

175 Fourth Avenue Building (FAB)
503-725-3524
www.pdx.edu/philosophy/

- B.A., B.S.
- Minor
- Minor in History and Philosophy of Science

For the requirements for this interdisciplinary minor, see History (p.272)

## Undergraduate program

Philosophy is the study of the most fundamental is sues concerning reality, knowledge, and value. Its fields include metaphysics (ultimate nature of reality), epis temology (nature of knowledge and reasoning), and ethics (principles of moral obligation). Through the study of the Philosophy Department's curriculum, students learn about the his torical traditions and contemporary theories in these fields. Philosophy 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. Thesetopics are addressed in areas such as philosophy of science, philos ophy of mind, philos ophy 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 oralargument. Philosophical training is then valuable in almost any area of life and any occupation that requires examination and analys is of problems, critical evaluation of alternative solutions, and rational advocacy of conclusions and courses of action. Philosophy is also an excellent undergraduate major for pre-professional students: philosophy majors outscore all other 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 forstudents planning careers in medicine. And finally, as the quintessential interdisciplinary course of 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 Philos ophy's undergraduate degree, go to
www.pdx.edu/academic-programs/a-z.

Admission to the department is based on general admission to the Univers ity. 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 philosophy 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

The Empiricists
Phl 419 Kant
Phl $420 \quad$ Wittgenstein
Phl 451 ClassicalFigures

| 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 Philosophy | 4 |
| Phl 448 | Biomedical Ethics | 4 |
| Phl 449 | Philosophy of Sustainability | 4 |
| Phl 460 | Contemporary European | 4 |
|  | Philosophy |  |
| Phl 470 | Philosophy of Science | 4 |
| Phl 471 | Topics in Philosophy ofScience | 4 |
| Phl 474 | Philosophy of Logic | 4 |
|  | Philosophy electives | 8 |

## 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.

The Philos ophy Department's Honors Option is designed to challenge and enrich the educational experience of outs tanding 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 departmentoffice or honors option coordinator.

## PHILOSOPHY MINOR

## REQUIREMENTS

To earn a minor in philosophy a student must complete 28 credits ( 8 credits of which must be taken in residenceat PSU), to include the following:
Courses

| Ph1 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
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 phenomenawe 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 orset 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. A wareness 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, magnetism, atomic and nuclear physics, quantum mechanics, and the physical properties of materials, learning both the theoretical and the experimental as pects.

Physicists are employed by almost all industries, particularly by the technical industries and by government laboratories. Roughly halfof all students with a bachelor's degree in physics go on to graduate work. In addition to a traditional graduate curriculum in physics or astronomy, they can enter programs in optics, applied physics, engineeringphysics, and education. 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

Admission to the department is based on general admission to the University. See Admis sions 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 Physics prior to thestart of their work in order that a coherent programcan be planned with their as signed adviser.

Students planning to transfer to PSU from community colleges or other 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 accomplished. Students need to choose between the standard option, the environmental physics option, the engineering physics option, and the biomedical option.

## 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 $203 \quad 4$
Ph 211 General Physics (with Calculus)I 4
Ph 212 General Physics (with Calculus) 4 II
Ph 213 General Physics (with Calculus) III
or
Ph 221 General Physics (with Calculus) I 3
Ph 222 General Physics (with Calculus) 3 II
Ph 223 General Physics (with Calculus) 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 $\mathrm{Ph} \quad 1$ 222 or Ph 232
Ph $216 \quad$ Lab for Ph 203 or Ph 213 or Ph 223 or Ph 233

Ph 311 Introductionto Modern Physics I 4
Ph 312 Introduction to Modern Physics 4
Ph $314 \quad$ Experimental Physics I 4
Ph $315 \quad 4$
Ph 316 Experimental Physics III 4
Ph $322 \quad 4$
Ph $424 \quad$ Classical Mechanics I 4
Ph 426 Thermodynamics and Statistical 4
Ph 431 Electricity and MagnetismI 4
Mth 251 Calculus I 4

| Mth 252 | Calculus II |
| :---: | :---: |
| Mth 253 | Calculus III |
| Mth 254 | Calculus IV |
| Mth 256 | Applied Ordinary Differential Equations |
| Mth 261 | Introduction to Linear Algebra |
| One year of general chemistry: |  |
| 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 |
| At least two of the following courses: |  |
| Ph 411 | Introductionto Quantum Mechanics |
| Ph 412 | QuantumMechanics II |
| Ph 425 | Classical Mechanics II |
| Ph 432 | Electricity and MagnetismII |
| Ph 434 | Methods of Mathematical |
|  | Physics |
| Ph 464 | Applied Optics |

Two courses in a related area of science or technology (minimum 6 credits total):
biology, geology, chemistry, computer science, electrical
engineering, orphysics
Subtotal: 101-104

## Environmental Option

Ph 202 General Physics
Ph 203 General Physics
or
Ph $211 \quad$ General Physics (with Calculus)
I
Ph 212 General Physics (with Calculus)
II
Ph $213 \quad$ General Physics (with Calculus)
III
or
Ph 221 General Physics (with Calculus)
I
Ph $222 \quad$ General Physics (with Calculus)
II
Ph $223 \quad$ General Physics (with Calculus)
III
With
Ph $214 \quad$ Lab for Ph 201 or Ph 211 or Ph 221 or Ph 231
Ph $215 \quad$ 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

Ph 311 Introductionto Modern Physics I 4
Ph 312 Introductionto Modern Physics 4
II
Ph 314 Experimental Physics I 4
Ph $322 \quad 4$
Ph 426 Thermodynamics and Statistical 4
Mechanics
Ph 431 Electricity and MagnetismI 4
Ph 471/ESM Physical and Human Dimensions 4
471
Mth 251
Mth 252
Mth 253
Mth 254
Mth 256

Mth 261 Introduction to Linear Algebra
Stat 451 Applied Statistics for Engineers
and Scientists I
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 1
Ch 228 General Chemistry Laboratory 1
Ch 229 General Chemistry Laboratory
Choose two of the following courses:

| Ph 315 | Experimental Physics II | 4 |
| :--- | :--- | :--- |
| Ph 316 | Experimental Physics III | 4 |
| Ph 411 | Introductionto Quantum | 4 |
|  | Mechanics |  |
| Ph 424 | Classical Mechanics I | 4 |
| Ph 432 | Electricity and MagnetismII | 4 |
| Ph 434 | Methods ofMathematical | 4 |
|  | Physics |  |
| Ph 464 | Applied Optics | 4 |
| Ph 473 | Alternative Energies | 4 |
| Ph 490 | Cellular and Molecular | 4 |

Choose 12 credits of electives from the following:
Bi 211 Principles of Biology: Molecular

Bi $214 \quad$ Principles ofBiology Lab I 1
Bi $215 \quad$ Principles of Biology Lab II 1
Bi 216 Principles ofBiology Lab III 1
Bi 357 General Ecology 4
Bi $476 \quad$ Population Ecology 5
Ch 360U Origins of Life on Earth 4
4

Development, Evolution \& Ecology
Principles of Biology:

| Ch 426 | Instrumental Analysis | 4 |
| :---: | :---: | :---: |
| Ch 427 | Instrumental Analysis | 4 |
|  | Laboratory |  |
| CE 371 | Environmental Engineering | 4 |
| ESM 220 | Introductionto Environmental | 4 |
|  | Systems |  |
| ESM 221 | Applied Environmental Studies: | 4 |
|  | ProblemSolving |  |
| 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 324 | Environmental Systems | 2 |
|  | Laboratory II |  |
| ESM | Air Quality | 4 |
| 460/CE 488 |  |  |
| G 322 | Global Biogeochemical Cycles | 5 |
| G 351 | Introduction to Oceanography | 4 |
| G 426 | Numerical Modeling of Earth | 4 |
|  | Systems |  |
| G 426L | Lab forG 426 | 0 |
| G 434 | Structural Geology and | 5 |
|  | Tectonics |  |
| G 458 | Astrobiology | 4 |
| G 462 | Hills lope Materials and | 4 |
|  | Processes |  |
| G 476 | Earthquake Geology | 4 |
| 310U/Sci |  |  |
|  |  |  |
| 333U |  |  |
| Geog 311U | Climatology | 4 |
| Geog | Climate Variability and Change | 4 |
| 312U/Sci |  |  |
| 334U |  |  |
| Geog 314U | Severe Weather | 4 |
| ME 320 | Fluid Mechanics | 4 |
| ME 415 | Advanced Topics in Energy | 4 |
|  | Conversion |  |
| ME 426 | Solar Engineering | 4 |
|  | 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) III |  |
| :---: | :---: | :---: |
|  | or |  |
| Ph 231 | General Physics I with Life | 4 |
|  | Science and Medical |  |
|  | Applications |  |
| Ph 232 | General Physics 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 orPh 231 |  |
| Ph 215 | Lab for Ph 202 or Ph 212 or Ph | 1 |
|  | 222 orPh 232 |  |
| Ph 216 | Lab for Ph 203 or Ph 213 or Ph | 1 |
|  | 223 orPh 233 |  |
| Ph 311 | Introductionto 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 | 4 |
|  | Mechanics |  |
| Required | physics courses: |  |
| Bi 211 | Principles of Biology: Molecular | 4 |
|  | Cell Biology \& Genetics |  |
| 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 | Introductionto Linear Algebra | 4 |

At least 12 credits of the following electives:

a) Courses particularly recommended for pre
professionals in biophysics, biomedical engineering,
medical physics:

Ph 315 Experimental Physics II
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 Biophysics | 4 |
| b) Courses particularly recommended for pre-health care professionals: |  |  |
| Bi 212 | Principles of Biology: | 4 |
|  | Development, Evolution \& |  |
|  | Ecology |  |
| Bi 213 | Principles of Biology: | 4 |
|  | Organisms, Biodiversity \& |  |
|  | Conservation |  |
| 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 (nonmajors) | 2 |
| Ph 337 | Physics in Biomedicine | 4 |
| Ph 490 | Cellular and Molecular Biophysics | 4 |
| Please see the undergraduate advis er to register for the |  |  |
| following OHSU subs titute cours es: |  |  |
| 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 | 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 |  |
|  | With |  |
| Ph 214 | Lab for Ph 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 for Ph 203 or Ph 213 or Ph | 1 |
|  | 223 orPh 233 |  |
| Ph 311 | Introductionto Modern Physics I | 4 |

Ph 312 Introduction to Modern Physics 4 II

Ph 319 Solid State Physics for 4
Engineering Students or

Ph 314 Experimental Physics I 4
Ph 315 Experimental Physics II 4
Ph 316 Experimental Physics III 4
Ph 322 Computational Physics 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 4
Mth 261 Introduction to Linear Algebra 4
$\begin{array}{cc}\text { At least four of the following electives } \\ \text { Ph } 401 & \text { Research }\end{array}$
Ph 402 Independent Study 4
Ph 411 Introductionto Quantum 4
Ph 424 ClassicalMechanics I 4
Ph 432 Electricity and MagnetismII 4
Ph 434 Methods of Mathematical 4
Physics
Ph 440 Physics of Solid State Devices
Ph 445 Microelectronic Device 4
Fabrication I
Ph 464 Applied Optics
Ph 481 Introductionto Nano(materials)- 4
Science and-Engineering
Ph $495 \quad$ Materials Physics: Structure and
Physical Properties ofOrdered and Disordered Condensed Matter

Three courses in a relatedarea of science or engineering (minimum 9 credits):
chemis try, computer science, $\quad 9-12$
electricalengineering,
mechanicalengineering, physics, or statistics

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 pass/no pass basis only.

PHYSICS MINOR

[^4]
## REQUIREMENTS

To earn a minor in physics a student must complete 27 credits ( 9 credits of which must be taken in residenceat PSU, and 12 to 15 credits of which must be upperdivision), to include the 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) III <br> With | 4 |
| 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 222 orPh 232 | 1 |
| Ph 216 | Lab for Ph 203 or Ph 213 or Ph 223 orPh 233 | 1 |
|  | Upper-division physics electives | $12-$ 15 |

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 either experimental 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
Ph 202
Ph 203

Ph 21
Ph 212
Ph 213

Ph 214
Ph 215
Ph 216

Ph 311
Ph 312
Ph 314
Ph 315
Ph 316
Ph 322

Ph 464
Ph 426
or
Thermodynamics and Statistical 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 Programwill depend on at least a C grade 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 theneeds of the individual student are planned in consultation with the graduate advisers.

The department offers graduate courses in classical mechanics, quantummechanics, electromagnetism, statistical mechanics, physics of condensed matter, atmospheric physics, and biophysics. Currentresearch areas in theoretical and experimental physics include: statistical physics, surface and materials physics (scanning tunneling micros copy, near-field optical microscopy, AFM, electron microscopy), molecular biophysics and membrane biophysics (detection oflife in extreme environments and transport in biological and artificial membranes), physics 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 graduatecredits 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-level courses:

| Ph 617 | QuantumMechanics | 4 |
| :--- | :--- | ---: |
| Ph 624 | ClassicalMechanics | 4 |
| Ph 631/ECE | Electromagnetic Fields and | 4 |
| 635 | Interactions |  |
| Ph 664 | Statistical Mechanics | 4 |
|  | And |  |
| Ph 507 | Seminar | 3 |
|  | Electives | 24 |
| Ph 503 | Thesis | 6 |

Subtotal: 45

## Non-Thesis Option

Three of the following 600-level courses:
Ph $617 \quad$ QuantumMechanics 4
Ph 631/ECE Electromagnetic Fields and 4
635 Interactions
Ph 624 Classical Mechanics
4
Ph 664 StatisticalMechanics 4

And

| Ph 507 | Seminar | 3 |
| :---: | :--- | ---: |
|  | Electives | 24 |
| Ph 504 | Cooperative | 6 |
|  | Education/Internship |  |
| Ph 506 | or | 6 |

Subtotal: 45
Typically, a thes is 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 doctoralstudents must earn a minimum of 81 credits beyond the bachelor's degree. Candidates for the Ph.D. in Applied Physics mustsatisfy requirements related to cours ework, seminar, and a dissertation, including a minimum of 69 credits as follows:

| Courses |  |  |
| :---: | :---: | :---: |
| Ph 585 | Experimental Methods in Applied Physics | 4 |
| Ph 617 | QuantumMechanics | 4 |
| Ph 618 | QuantumMechanics | 4 |
| Ph 624 | ClassicalMechanics | 4 |
| Ph 631/ECE | Electromagnetic Fields and | 4 |
| 635 | Interactions |  |
| Ph 632/ECE | Electromagnetic Fields and | 4 |
| 636 | Interactions |  |
| Ph 607 | Seminar | 6 |
| Ph 603 | Dissertation | 27 |
|  | Electives | 12 |

Electives: (all from one specialty area)
Subtotal: 69
Approved electives 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 dissertation.

## Pre-professional Programs

503-725-3822,
Suite 360 FariborzMaseehHall (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 programschedules 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 preprofes sional students should check with their as signed advis or to keep current on all recent changes and remaining requirements.

## Pre-Professional Health Programs

Advisors: A. Dart, A. Douangpanya, K. Kordecki, L. Marsh, S. Nguyen, A. Schmidt, L. Shatzer, L Shrestha, M. Yates.

Professional advisors in the Health, Science, and theEarth adv is ing pathway adminis ter 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, cours ework and resources all des igned to support and guide students' efforts to apply to undergraduate and graduate health programs offered at other institutions. 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 transfer to undergraduate professional health sciences programs at other institutions to complete their bachelor's degrees. The students' focus at Portland State is on fulfilling the admis sions requirements of receiving institutions. Transfer programs include the following:

Medical Laboratory Science
DentalHygiene
Nursing
Radiation Therapy
Students choosing to continueat PSU, rather than pursue a pre-professional transfer programshould meet with their as signed advis or with in the Health, Science, \& the Earth advis ing pathway to determine PSU graduation requirements.
Bachelor's degree programs are those designed to prepare students formasters and doctoral programs in the health sciences that require orrecommend 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) select a major and fulfill Portland State's graduation requirements, and b) fulfill the prerequisite coursework required by the professional
graduate programs to which they plan to 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 he or she completes both Portland State's graduation requirements and those of the receiving professional institutions. Professional schools do not prefer one major over another. They do look for students who perform well in prerequisite coursework and who are broadly educated; this can be accomplished with any major.
Professional 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
Physical Therapy
Physician Assistant
Veterinary Medicine
A typicalpre-professional health program, whether it is a transfer 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 cours ework and activities strategically; to integrate personal, academic, and career goals; to develop 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 admis sion to profes sional health sciences programs. Advisors also provide students with guidance on selecting a major, preparing for graduate admis sions tests such as the MCAT and GRE, organizing letters of evaluation, and writing the personal statement for admissions applications.

## POSTBACCALAUREATE PRE-MEDICAL PROGRAM

Forstudents whoalready have a bachelor's degree butare 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 withouts ignificant 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. Cours ework may include year-long sequences in generalchemistry, biology, organic chemistry, and physics, as well as single term courses 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 pathway advis or to determine a course plan that works best with their goals.
The postbaccalaureate pre-medical program is not a certificate program. Manypostbaccalaureate pre-medical students do, however, easily complete a degreein science (science is an interdisciplinary major at Portland State) while completing prerequisite coursework 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 preprofes 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 Earth advising pathway.

## POSTBACCALAUREATE PRE-DENTAL PROGRAM

For students 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 pathway advisor to develop a plan for completing the pre-dental coursework as well as gain relevantexperiences prior to applying to dental school.

The postbaccalaureate pre-dental program is not a certificate program. Manypostbaccalaureate pre-dental students do, however, easily complete a degree in science (science is an interdisciplinary major at Portland State) while completing prerequisitecoursework for dental school. Pursuing a second degree while working on preprofes 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 prospectiveK-12 teachers in the College of Education, through the Graduate TeacherEducation Program(GTEP) and the Special Educator Program(SPED). The Special Educator Program prepares teachercandidates to work as Special Education Teachers in Pre-K through grade 12 settings and results in the teacher candidate receiving the Oregon 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. Forstudents interested in the BA/BS in SpecialEducation degreeand licensure program, please visit
https://www.pdx.edu/sped/sped-undergraduate. Pas sing scores on teacher exams mandated by the Oregon Teachers Standards and Practices Commis sion (TSPC) are also required for entry 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 FariborzMaseehHall (FMH)
Advisors: K. Utschig and E. Benner

## EARLY CHILDHOOD AND ELEMENTARY 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 upper elementary level), Psychology, and Child, Youth, and Family Studies. Prospectiveelementary teachers should consult with a PreEducation Advis or in the advising office.

## SECONDARY (MIDDLE/HIGH SCHOOL) EDUCATION

Prospective middle and high school teachers may receive general introductory pre-professional advis ing with a PreEducation Adviser, however, subsequent advising for presecondary education should be with the academic advisor for the secondary education content areathey wish to teach. These specialized advisors are familiar with all GTEP admiss ion 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 (physical education); history, anthropology, sociology, philosophy, political science, geography, andeconomics (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 (speech).
Additional information is available online, or by contacting GTEP admiss ions at (503) 725-4619.

## SPECIAL EDUCATION

All prospective specialeducators, 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 currentor prospective PSU Students who are considering application to GTEP at PSU should attend one of the College of Education's regularly held information sessions forprospective applicants. A currentschedule of upcoming information sessions is available online, along with an online form to register to attend a specific session. For additional information, please contact the College of Education (askcoe@pdx.edu; 503-725-4619).

## PREPARATORY COURSEWORK

## Early childhood and elementary educators:

## Required:

Lib 428
Children's Literature, K-5

| Mth 211 | Foundations Of Elementary <br> Mathematics I | 4 |
| :--- | :--- | :--- |
| Mth 212 | Foundations Of Elementary | 4 |
| Mth 213 | Mathematics II <br> Foundations OfElementary <br> Mathematics III | 4 |

Recommended:
Art 312 Art in the Elementary School 4
CI 432 Computer Applications for the 3
Ed $420 \quad$ Introduction to Education and 4 Society
Mus 381 Music for Elementary Teachers 4
Psy 311U Human Development 4
SpEd 418 Survey of Exceptional Learners 3
(please see the Minor in Elementary Education)
Middle, junior, and high school educators:
In addition to a strong liberal arts education, all students should complete the requirements for their major in the endorsement area of their choice.

## Required:

Psy 311U Human Development 4
Recommended:

| Psy 311U | Human Development <br> CI 432 <br> Computer Applications for the |
| :--- | :--- |
| Ed 420 | Classroom <br> Introduction to Education and <br> 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 majorshould be aware that the integrated scienceendorsementrequires additional science courses beyond the coursework required for a major in general science. Courses pertaining to all of the Earth/Space, Life, and Phys ical Science Content
Standards are required. Guidelines for a course ofstudy for the integrated scienceendorsement include the following.

## Science Requirements

## Earth/Space Content Area: (20 credits)

Lower division geology with
labs/field studies

> Upper-division earth science courses

Upper-division earth science courses: distributed among geology, paleontology, geomorphology, oceanography, hydrology, weather and climate, planetary science, astronomy.
Life ScienceContent Area: ( 15 credits)

| Bi 211 | Principles of Biology: Molecular | 4 |
| :---: | :--- | :---: |
| Bi 212 | Cell Biology \& Genetics <br> Principles of Biology: | 4 |
| Bi 213 |  <br> Ecology |  |
|  | Principles of Biology: <br>  <br> Conservation | 4 |

with required 1-credit labs (Bi214, Bi 215, and Bi 216).
Physical ScienceContent Area: (15 credits)
200-level General Physics or
General Chemistry
with labs
Upper Division Science Electives ( 20 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, environmentalscience) or math prerequisites.

| Mathematics and Statistics Content Area: (12 credits) |  |  |
| :---: | :---: | :---: |
| Stat 243 | Introduction to Probability and Statistics I |  |
| Eight credits from: |  |  |
| Mth 111 | Introductory College |  |
|  | Mathematics I |  |
| Mth 112 | Introductory College |  |
|  | Mathematics II |  |
| Mth 251 | Calculus I |  |
| Mth 211 | Foundations Of Elementary |  |
|  | Mathematics I |  |
| Mth 212 | Foundations Of Elementary |  |
|  | Mathematics II |  |
| Mth 213 | Foundations Of Elementary | 4 |
|  | Mathematics III |  |
| 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 adv isor 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 aboutany of the educationminors, contact Pre-teacher Education Advisors, FMH 360, 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 Teacher Education Program(GTEP), it does include all the prerequisites for admission to the program. Students seeking a license for early childhood and elementary education must complete a graduate-levellicensure program. The College of Education provides the teacher licensure 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 | 4 |
| Mth 212 | Foundations OfElementary | 4 |
|  | Mathematics II |  |
| Mth 213 | Foundations OfElementary | 4 |
|  | Mathematics III |  |
| Education (7 credits) |  |  |
| Ed 420 | Introduction to Education and | 4 |
|  | Society |  |
| 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 ( $\mathbf{8}$ credits)

| Art 312 | Art in the Elementary School |
| :--- | :--- |
| Mus 381 | Music for Elementary Teachers |


| Health (4 credits) |  |
| :--- | :--- |
| PHE 250 | Our Community: Our Health <br> or <br> PHE 365Health Promotion Programs for <br> Children and Youth |

Fine and Performing Arts (8 credits)
Mus 381 Music for Elementary Teachers
Health (4 credits)
PHE 250 Our Community: Our Health

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 musttake 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: 54

## ELEMENTARY EDUCATION SCIENCE MINOR

The Minor in Elementary Education Science is intended for students who plan to enter a graduate teachereducation programand be licensed in Early Childhood/Elementary Education. While the minor is not a requirement for admission to the PSU Graduate Teacher Education Program(GTEP), it does include all the prerequisites for admission to the program. Students seeking a license for early childhoodandelementary education mustcomplete a graduate- level licensure program. The Graduate School of Education provides the teacher licensure as part of the GTEP .

## REQUIREMENTS

## Minor Concentration Options

Choose 2 courses fromone concentration.

## Anthropology

| Anth 101 | Introduction to Biological <br> Anthropology | 4 |
| :---: | :--- | :---: |
| Anth 102 |  |  |
| Biology |  |  |
| Bi 201 |  |  |$\quad$| Introductionto Archaeology |
| :--- |$\quad 4$


| Ch 107 | Introductory Chemistry <br> Laboratory I | 1 |
| :--- | :--- | :--- |

Sci 335U Water in the EnvironmentI 4 or
Sci 336U Water in the EnvironmentII
Ch 104 and Ch 107 are required for this option.

## Geography

Geog $210 \quad$ Physical Geography 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 | Dynamic Earth: Interior <br> With | 3 |
| :--- | :--- | :--- |
| G 204 | Geology Laboratory | 1 |
| G 341U | Geology ofthe Oregon Country | 4 |
| G 344U | Geology and the National Parks | 4 |
| G 355 | Earth and Space Sciences for | 4 |
|  | Elementary Educators | 4 |
| G 430 | Life ofthe Past |  |

G 355 is required forthis option.

## Physics

| Ph 101 | Essentials ofPhysics | 4 |
| :--- | :--- | :--- |
| Ph 102 | Essentials ofPhysics | 4 |
| Ph 361U/Sci | General Astronomy I | 4 |
| 315U |  |  |
| Sci 316U/Ph <br> 362U | General Astronomy II | 4 |

Ph 101 is required forthis option.

## Core Courses

Mth 211 Foundations OfElementary 4

Mth 212 Foundations OfElementary 4
Mth 213 Foundations OfElementary 4

Sci 201 Natural Science Inquiry 4
UnST 286 Natural Science Inquiry 4
Sci311U Teaching Everyday Science 4
UnSt 421 Capstone 1-6
Lib 428 Children's Literature, K-5 3
Two classes froma 8-9
concentration listed below

## 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. The minor is not a requirement foradmiss ion to the PSU Graduate Teacher Education Program(GTEP), and students must also complete the content courses required by the department for the subject they plan to teach to apply to GTEP. Students seeking a license for secondary education must complete a graduate-level licensure program.

## REQUIREMENTS

| Core Courses |  |  |
| :---: | :---: | :---: |
| Ed 420 | Introductionto Education and | 4 |
|  | Society |  |
| CI 432 | Computer Applications for the | 3 |
|  | Classroom |  |
| Psy 311U | Human Development | 4 |
| Soc 337U | Prejudice, Privilege, and Power | 4 |
| SpEd 418 | Survey of Exceptional Learners | 3 |
| Electives (7-10 credits): |  |  |
| (choose 2 classes) |  |  |
| Anth 315U | American Culture | 4 |
|  | or |  |
| BSt 302U | The Contemporary African | 4 |
|  | American Experience |  |
|  | or |  |
| ChLa 301U | Chicano/Latino Communities | 4 |
| CFS 385U | Working with Diverse Families | 4 |
|  | or |  |
| CFS 390U | Sex and the Family | 4 |
| Lib 429 | Young Adult Literature | 3 |
| Phl 331U | Philosophy of Education | 4 |
| Psy 345 | Motivation | 4 |
|  | or |  |
| Psy 346 | Learning | 4 |
| SpEd 460 | Outdoor Education/Recreation | 6 |
|  | With Persons With Dis abilities |  |
| WS 301 | Gender and Critical Inquiry | 4 |
|  | or |  |
| WS 360U | Introductionto Queer Studies | 4 |
|  | 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, 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 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 foradmission to thePSU 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 special education must complete a graduate-level program. The Graduate School of Education recommends students forteacher licensure at the completion of the Special Education Program.

## REQUIREMENTS

## Core Courses

| Psy 311U | Human Development | 4 |
| :---: | :---: | :---: |
| Mth 211 | Foundations OfElementary | 4 |
|  | Mathematics I |  |
| Mth 212 | Foundations OfElementary | 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 Disability Studies |  |
| SpEd 417 | Introduction to Special Education | 4 |
| SpEd 418 | Survey of Exceptional Learners | 3 |
| SpEd 460 | OutdoorEducation/Recreation | 6 |
|  | With Persons With Dis abilities |  |
| 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 | 4 |
|  | Early Maturity <br> Teaching Everyday Science | 4 |
| SpEd 455 | Working With LEP Children | 2 |
|  | Who Have Special Needs |  |
| SpHr 365U | Survey of Speech, Language, and | 4 |
|  | Hearing Disorders |  |
| SpHr 372U | Speech and Language | 4 |
|  | Development in Children |  |

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 ofC-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 cours ework is required.
Subtotal: 41-43

## Pre-Law Preparation

## Pre-Law Preparation

For Liberal 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 notrequire 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 administration and criminology and criminal justice, when strongly supplemented with work in arts and letters, science, or social science, are also 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 social science.
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 admis sion have a bachelor's degree. Valuable information about pre-law study and law school admissions can be found on the Law SchoolAdmission 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 Univers ity College ofLaw. These programs are restricted to certain undergraduate majors and allow for a studentto 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. Lawschools 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 complexfact situations, and of communications skills, cannot be overemphasized, for lawyers must be able to research, analyze, and communicate.

And since law is a part of the larger social order, the prelaw studentshould 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 toward that end, the following are suggested with a reminder that they are not prerequisites for law school admission:
introductory economics (Ec 201, Ec 202); ethics (Phl 308U, Ph1 445, Ph1 446, Ph1447); 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); psychology (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 SchoolAdmission Test(LSAT), administered nationally by the Law School Admission 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.lsac.org. The exam is offered fourtimes 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 essential for success in law school: the reading and comprehension of complextexts with accuracy and insight; the organization and management of information and the ability to draw reas onable inferences fromit; the ability to think critically; and the analysis and evaluation of the reasoning and arguments of others." It does not test knowledge of specific subjects, and is in no sensea test of knowledge about law. There is no standard "passing score" 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 lawschools 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 forthe testas 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 SchoolAdmission Council's website. Students interested in attending law school are strongly encouraged to meet with one of the pre-law advisors listed above for more specific guidanceabout 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 Psychology


## 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 their efforts 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 psychology as part of liberal arts education; and students of other social sciences or in a professional field such as business, education or medicine who seek a working knowledgeofpsychological principles.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for Psychology'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 Admissions 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-level course or any course with statistics as a prerequisite.

All students majoring in psychology, especially those that are considering graduate work in psychology, are
encouraged to plan their programwith an advisor from the 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 program is 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 | 4 |
| :--- | :--- | :--- |
|  | Statistics I |  |
| Stat 244 | And |  |
|  | Introduction to Probability and | 4 |
|  | Statistics II |  |

or
Stat 243 Introduction to Probability and 4 Statistics I
And
Psy $320 \quad$ Social Science Research 4
Methods II
or
Soc 396 Social Research Methods, Social 4 Statistics
And
Psy $320 \quad 4$
Methods II
Psy $200 \quad$ Psychology as a Natural Science 4
Psy $204 \quad$ Psychology as a Social Science 4
Psychology elective200-level or 4 above (including 399-409)
Psy $321 \quad$ Research Methods in Psychology 4
Psy 410-498 16
Additionalupper division 20 psychology courses (300-or 400level, 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 formany 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 requirementstudents can choose to take any 300-or 400-level class in the following
subjects: Black Studies, Chicano/Latino Studies, Indigenous Nations Studies, and Women's Studies, or any of the following classes:

| Anth 318U | Asian American Experience |  |
| :---: | :---: | :---: |
| Anth 426 | Transnationalismand Migration |  |
| Anth 432 | Gender, Sex, and Sexuality in Anthropological Perspective | 4 |
| Comm 415 | Problems of Intercultural |  |
|  | Communication |  |
| CR 312 | Intercultural Conflict Resolution |  |
| Psy 310U | Psychology of Women |  |
| Psy 410 | Cross-cultural Psychology |  |
| Psy 410 | LGBTQ Psychology |  |
| Psy 410 | Native American Psychological Healing |  |
| Psy 425 | Psychology of Black Manhood in America | 4 |
| Psy 426 | Psychology of Stigma \& Social Inequality |  |
| Psy 428 | Diversity, Prejudice and Intergroup Relations |  |
| Psy 429 | The Psychology of Race \& Gender in Sport |  |
| Psy 431U | Psychology of Men and |  |
|  | Masculinities |  |
| Psy 458 | Development \& Education of African-Dias pora Children \& | 4 |
|  | Youth |  |
| Psy 463 | Developmentand Educationof Immigrant Children and Youth | 4 |
| Psy 469 | Psychology of Human Sexuality | 4 |
| Psy 470 | Diversity in the Workplace |  |
| Soc 337U | Prejudice, Privilege, and Power |  |
| Soc 344U | Gender and Sexualities |  |
| Soc 423 | Stratification |  |
| Soc 427 | Gender and Work |  |
| Soc 430 | Hate Crimes |  |
| Soc 444 | Race, Ethnicity, and Nationality |  |
| Soc 446 | Immigrants in America |  |
| Soc 452 | Education and Equality: |  |
|  | Comparing the US, Asia, Europe |  |
| Soc 463 | Global Inequalities and Health |  |

The list above is notcomprehensive; 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 grade ofC- 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 psychology 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 mustcomplete 28 credits ( 8 credits of which must be taken in residenceat 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. 279))

## Graduate programs

The Department of Psychology offers work leading to the degrees of Master of Arts andMaster of Science. The departmentalso offers a Ph.D. in Applied Psychology.
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 emphasis on five areas: Applied Developmental, Industrial Organizational, Applied Social, Community, and Applied Quantitative Psychology. The aim is 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 Psychology) or the terminal master's degree
(M.A. or M.S. in Psychology) programs. Those admitted to the master's programmay later apply foradmission 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. Admissions 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 from individuals 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 the following 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 forthe Master of Science degree. Students' individual programs are determined in consultation with their advisors.

## REQUIREMENTS

The required coursework for the master's programis as follows:

| Courses |  |  |
| :---: | :---: | :---: |
| Psy 521 | Univariate Quantitative Methods | 5 |
| Psy 522 | Multiple Regression and | 5 |
|  | Multivariate Quantitative |  |
|  | Methods |  |
| Psy 514 | Advanced Applied Social | 4 |
|  | Psychology |  |
| Psy 515 | Advanced Applied | 4 |
|  | Developmental Psychology |  |
| Psy 516 | Advanced Organizational | 4 |
|  | Psychology |  |
|  | Electives | 24 |
| Psy 503 | Thes is | 8 |

## Thesis

The student mustsubmit 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 graduatecourses. Candidates will undertake a programofstudy determined in consultation with an advisory 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-yearmaster's program, is as follows:

| Courses |  |  |
| :---: | :---: | :---: |
| Psy 621 | Univariate Quantitative Methods | 5 |
| Psy 622 | Multiple Regression and | 5 |
|  | Multivariate Quantitative |  |
|  | Methods |  |
| Psy 624 | Research Design in Applied | 4 |
|  | Psychology |  |
| Psy 6xx | Required methodology elective | 4 |
| Psy 614 | Advanced Applied Social | 4 |
|  | Psychology |  |
| Psy 615 | Advanced Applied | 4 |
|  | Developmental Psychology |  |
| Psy 616 | Advanced Organizational | 4 |
|  | Psychology |  |
| Psy 618 | Ethics and Professional Is sues in | 4 |
|  | Applied Researchand Practice |  |
| 6XX | Electives in Community | 12 |
|  | Psychology |  |
|  | or |  |
| 6XX | Electives in Applied Social | 12 |
|  | Psychology |  |
|  | or |  |
| 6XX | Electives in Developmental | 12 |
|  | Psychology |  |
|  | or |  |
| 6XX | Electives in | 12 |
|  | Industrial/Organizational |  |
|  | Psychology |  |
|  | or |  |
| 6XX | Electives in Applied Quantitative | 12 |
|  | Psychology |  |
| 6XX | AdditionalElectives | 27 |
| Psy 503 | Thesis | 8 |
| Psy 603 | Dissertation | 27 |

Psy 621, Psy 622, Psy 624: passing grade ofB+ or higher required Subtotal: 108

## Comprehensive examination: The compre hensive exam is comprised of exams in the major are 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 StudentHandbook which can be found on the graduate page ofthe 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 Doctoral Program


## 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 participant observation. This information is analyzed and used to explain phenomena such as power relations, beliefs and value systems, organizations, 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 prepares students for graduate programs leading to careers in research, public service, and higher education. Sociological knowledgehelps create informed and thoughtfulcitizens.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for Sociology's undergraduate degrees, go to www.pdxedu/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.

## 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.

| Courses |  |  |
| :---: | :--- | ---: |
| Soc 200 | Introductionto Sociology | 4 |
| Soc 301 | Classical Sociological Theory | 4 |
| Soc 302 | Contemporary Sociological | 4 |
|  | Theory |  |
| Soc 397 | Social Research Methods | 5 |
| Soc 398 | Sociology Research Project | 4 |
|  | Sociology electives, including at | 28 |
|  | least 12 credits in 400-level <br> courses |  |
| Stat 243 | Introductionto Probability and | 4 |
|  | Statistics I |  |

Up to 10 credits of electives takenunder the undifferentiated grading option (pass/no pass) in 200- or 300-level sociology courses can be applied toward fulfilling departmentalmajor requirements. Differentiated grades of Cor above are required for all othersociology courses and for Stat 243. A studentmust pass Soc301 and Soc 302 with a grade of C or better before taking other required courses as a sociology major.
Subtotal: 53

## SOCIOLOGY MINOR

To earn a minor in sociology a student mustcomplete 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 Introductionto 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 $\mathrm{MA} / \mathrm{MS}$ 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.279)).

## 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 Philos ophy (Ph.D). Students with a Bachelor's degree may enter our Master's degree program, which offers training in both quantitative and qualitativeresearch methods. The candidate pursuing a terminal M.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 Ph.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 otherthan Sociology), and 8 credits of thesis. The student must pass an oral defenseof 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-relevant research 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. 407)

## 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 thosestudents 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 admission requirements for advanced degrees, the applicant for a sociology master's or Ph.D. degree programmust havethe 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.
- Unofficialtranscripts fromall post-secondary institutions attended for evaluation purposes. Official transcripts will be requested onceadmitted.
- 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 undergraduate majors may be accepted; however, they must have completed courses in sociological theory, research methods, and statistics, or their equivalents.

## DEGREE REQUIREMENTS

See University master's degree requirements (p.51).
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 | Social Research Strategies | 4 |
| :--- | :--- | :--- |
| Soc 591 | Theoretical Perspectives in | 4 |

Soc $592 \quad$ Qualitative Methods 4
Soc 593 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 ( 12 credits)

| Soc | Three graduate-level sociology <br> courses | 12 |
| :--- | :--- | :--- |
|  | Sociology or other department | 12 |

Elective courses outside sociology must be approved by the student's adviser

REQUIREMENTS FOR NON-THESIS M.AMM.S.

## Core ( $\mathbf{2 5}$ credits)

Soc 590 Social Research Strategies 4
Soc 591 Theoretical Perspectives in 4
Soc 592 Qualitative Methods 4
Soc 593 Quantitative Methods 4
Soc 537 Qualitative Data Analysis 4
Soc 595 Research Practicum 4
Soc 507 Professionalization Seminar 1
Electives (20 credits)
500/600 level electives
( 8 credits mustbe in Sociology courses.)

## 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 dissertation 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 | Medical Sociology | 4 |
| Soc 686 | Topics in Health and Inequality | 4 |
| Soc 687 | International Health Inequalities | 4 |
| Soc 688 | Social Sustainability Theory and | 4 |
|  | Practice | 4 |
| 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, res earch project and comprehensive exam)

$$
\begin{array}{lll}
\text { Soc } 603 & \text { Dissertation } & 27 \\
\hline
\end{array}
$$

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 ofSpeech 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
dis orders. 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, swallowing 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/or 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 W ork, and Community Relations. Coursework or a degree in Speech and Hearing Sciences complements degrees in other programs, such as education, linguistics, psychology, public health administration, socialwork, 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 forentry into PSU's graduate programin SPHR, and provides the required educational component for licens ing of Speech-Language Pathology A ssistants in Oregon and other states.

## 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/undergraduat e/speech-and-hearing-sciences.

## ADMISSION REQUIREMENTS

Admission to the department is based on general admission to the University. See Admis sions 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 pursue graduate study should completeoneor 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). It is strongly recommended that these courses are taken prior to taking Advanced Core Courses. A grade ofC-or above is required for all major requirements.

| Foundational Core Courses (28 credits) |  |  |
| :---: | :---: | :---: |
| SpHr 222 | Introduction to Speech, | 4 |
|  | Language \& Hearing Sciences |  |
| SpHr 370 | Phonetics and Acoustics | 4 |
| SpHr 371 | Anatomy and Physiology of | 4 |
|  | Speech and Swallowing |  |
| 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 ( 25 credits) |  |  |
| SpHr 394 | Guided Observation | 1 |
| SpHr 463 | Language Dis orders in Children | 4 |
| SpHr 464 | Speech Dis orders in Children | 4 |
| SpHr 488 | Clinical Audiology | 4 |
| SpHr 489 | Aural Rehabilitation | 4 |
| SpHr 495 | Neurogenic Communication Disorders | 4 |
| SpHr 496 | Introductionto Clinical | 4 |
|  | Management |  |
| Elective Courses (choose 8 credits) |  |  |
| SpHr 385 | AutismSpectrumDisorders | 4 |
| SpHr 471 | Neurolinguistics | 4 |
| SpHr 473 | Perspectives on Disability | 4 |
| SpHr 480 | Introductionto Sociocultural | 4 |
|  | Aspects of Interactions |  |
| SpHr 485 | Bilingualism and | 4 |
|  | Communication Disorders |  |
| SpHr 491 | Principles of Behavior Analysis: 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, dis tributed as follows:

## FOUNDATIONAL CORE COURSES

SpHr $370 \quad$ Phonetics and Acoustics

| SpHr 371 | Anatomy and Physiology of Speech and Swallowing | 4 |
| :---: | :---: | :---: |
| SpHr 372U | Speech andLanguage | 4 |
|  | Developmentin Children |  |
| SpHr 461 | Neurology of Speech and | 4 |
|  | Hearing |  |
| SpHr 487 | Hearing Sciences | 4 |
|  |  |  |
| CLINICAL CORE COURSES |  |  |
| SpHr 463 | LanguageDis orders in Children | 4 |
| SpHr 394 | Guided Observation | 1 |
| SpHr 464 | Speech Dis orders in Children | 4 |
| SpHr 488 | Clinical Audiology | 4 |
| SpHr 489 | Aural Rehabilitation | 4 |
| SpHr 495 | Neurogenic Communication | 4 |
|  | Disorders |  |
| SpHr 496 | Introductionto Clinical Management | 4 |

Subtotal: 25

## ELECTIVE COURSE (CHOOSE 4 CREDITS)

In addition to taking the aboverequired 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 480 | Introduction to Sociocultural <br> Aspects of Interactions <br> Bilingualism and | 4 |
| :--- | :--- | :--- |
| SpHr 485 | Communication Disorders | 4 |
| SpHr 473 | Perspectives onDisability <br> SpHr 410 <br> Selected advisor-approved <br> course that explores diverse <br> human experiences | 4 |
| Anth 318U | Asian American Experience <br> Anth 426 | Transnationalismand Migration <br> Anth 432 | | Gender, Sex, and Sexuality in |
| :--- |$\quad 4$


| Psy 463 | Development and Education of <br> Immigrant Children and Youth | 4 |
| :--- | :--- | :--- |
| Soc 337U | Prejudice, Privilege, and Power | 4 |
| Soc 344U | Gender and Sexualities | 4 |
| Soc 423 | Stratification | 4 |
| Soc 427 | Gender and 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 |
| Soc 463 | Comparing the US, Asia, Europe |  |

Subtotal: 4
The above list is not comprehensive; students canalso select a course not included here with advisor approval.

## Total Credit Hours: 49

Students need to earn a C- or higher in all courses to earn the certificate. 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 SpeechLanguageHearing Association(ASHA) requirements of a biological science course, a chemis try or physics course, and a socialscience 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 stateofOregon.

The graduate curriculumincludes courses aimed at providing students with a strong foundation in the nature of speech, language, communication, and swallowing dis orders as well as the screening, assessment, and treatment of those dis 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 admission to graduate programs (p.41), candidates for the Master's degree programin speech-language pathology must havea 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 | 4 |
|  | Speech and Swallowing |  |
| 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 | 4 |
|  | Statistics I |  |
|  | And |  |
| Stat 244 | Introduction to Probability and | 4 |
|  | Statistics II |  |

These prerequisites can be met by completing a Bachelor's degree in Speech and Hearing Sciences at Portland State Univers ity or elsewhere. Individuals with Bachelor's degrees in other disciplines may complete prerequis ite 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: THE FOLLOWING ARE LISTED ON THE UNDERGRADUATE DEGREE PROGRAM, NOT THE POSTBACCALAUREATE PROGRAM

The following courses are strongly recommended:
Courses

| SpHr 463 | LanguageDis orders in Children | 4 |
| :--- | :--- | :--- |
| SpHr 464 | Speech Dis orders in Children | 4 |
| SpHr 495 | Neurogenic Communication | 4 |
|  | Disorders |  |
| SpHr 496 | Introduction to Clinical <br>  <br>  <br> Management | 4 |

All students apply ing 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 (see current A SHA Certification Standards).

Students may apply for admis sion to the master'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 proce dure

Candidates applying for admission to the graduate program in Speech andHearing Sciences must submit application packets to both the Department and the PSU Admissions Office, as outlined in Master of Arts and Master of Science (M.A. and M.S.). Specific requirements of the Department include:

1. Three letters ofreference 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. A written narrative (Pers onal Statement) outlining the candidate's academic background and professional goals.

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 University Master's degree requirements (p. 51). 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 mustcomplete 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 ofB-or above must be obtained for each course.
CORE Courses ( 50 credits):
SpHr 530 Evidence-based Practices in
Communication Dis orders
$\mathrm{SpHr} 540 \quad$ Multicultural Topics in Communication Dis orders
$\mathrm{SpHr} 541 \quad$ Bilingual Topics in Communication Dis orders
SpHr 545 Pathways to Professional

| SpHr 554 | Advanced Speech Sound Disorders:Theories and Application | 4 |
| :---: | :---: | :---: |
| SpHr 555 | Assessmentand Treatment of Dysphagia in Adults | 2 |
| SpHr 556 | Assessmentand Treatment of Dysphagia in Pediatrics | 2 |
| SpHr 558 | SymbolSystems in Early Communication or | 2 |
| SpHr 559 | Augmentative and Alternative Communication | 2 |
| SpHr 560 | Research Methods in Communication Sciences and Disorders | 4 |
| SpHr 562 | Cognitive Rehabilitation | 4 |
| SpHr 563 | Adult Language Disorders | 4 |
| SpHr 566 | Motor Speech Dis orders | 4 |
| SpHr 581 | Stuttering | 3 |
| SpHr 582 | Voice Disorders | 3 |
| SpHr 584 | Assessmentand Treatment of LanguageDisorders: Birth to Age Five | 4 |
| SpHr 585 | Assessmentand Treatment of Language Dis orders in Schoolaged Children and Adolescents | 4 |
| ELECTIVE | Courses (choose three; 6 credits): |  |
| SpHr 546 | Professional Ethics | 2 |
| SpHr 553 | Counseling in Communication Disorders | 2 |
| SpHr 564 | Medical Speech-Language Pathology I | 2 |
| SpHr 567 | Cleft and Craniofacial Disorders | 2 |
| SpHr 586 | Autism | 2 |
| SpHr 587 | Advanced Topics in Literacy in Children with Language Impairments | 2 |
| SpHr 588 | Advanced Assessment and Intervention for Bilinguals | 2 |
| 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 professional certification. These include 25 hours of observation. In order to receive credit for clinical hours completed in a clinical practicumexperience, the studentmust obtain a grade ofB- or above in the course. Students will have the opportunity to satisfy this requirement by completing 18 required credits of SpHr 509 Practicum, which shall include PSU clinic experiences and two externships. |  |  |

5. Culminating Experience. Students mustcomplete 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-The student 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 administration and scoring of the exams will follow current departmental guidelines. Students will register for 3 credits of SpHr 501 Research: Comprehensive Examination during the term in which they write the examination. This is the only graduate course offeredon a Pass/No Pass basis.
b. Master's Project-The student will complete a scholarly project related to his or her academic discipline at the invitation of a faculty member. The student will comply with current departmental guidelines on the selection of the topic and format ofthe project. The project will be completed under the direction of faculty member in the department ofSpeech and Hearing Sciences. Students pursuing this option are required to reg is 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 at the invitation of a faculty member will follow the University guidelines for theses outlined in Thesis (p. 53). In addition to the written thes is, the student must pass a final oral examination before a committee consis ting of at least three faculty members fromthe department of Speech and Hearing Sciences. Students pursuing this option are required to register for a minimum of 6 to 9 credits of SpHr 503 Thes is. A letter grade ofB- or above is required.

## Systems Science Program

Harder House
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 them for modeling and analysis in conjunction with ideas and methods fromother disciplines, and gain expertise in problemsolving and integrative thinking.

## ADMISSION REQUIREMENTS

Students applying to the Masters programmust submit the following for evaluation by the Systems Science Admissions 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 REQUIREM ENTS

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. Among 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 oneof 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 ofSySc 507 (Seminar) with a pass grade, and/or up to 4 Systems Science by-arrangement credits. The studentmust 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 ofSySc 507 (Seminar) with a pass grade, approved courses fromother departments (see http://www.pdx.edu/sysc/approved-courses-ms-sysc), and/orup to 4Systems 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. Coursework-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 ofSySc 507 (Seminar) with a pass grade, and/or up to 4 credits of Sys tems Science by-arrangementcredits.

More detailed information is available in the Systems Science Graduate Student Handbook 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 dynamics, data modeling, computer simulation, networks, complexadaptive systems, and decision analysis. Subject areas include environmental systems, sustainability, energy, health policy, biomedicine, and other areas where systems ideas or methods make unique contributions to knowledge.

## ADMISSION REQUIREMENTS

To apply to the doctoral program, applicants must submit the following to for evaluation by the Systems Science Admissions Committee:

1. A completed Application to GraduateProgramform,
2. Academic transcripts fromeach institution attended,
3. GRE scores,
4. Three letters of recommendation,
5. Personal statement explaining student's interests and goals, and
6. TOEFL score or other evidenceof English competency if attending as foreign student.

## DEGREE REQUIREMENTS

General requirements for doctoral degrees can be found at the Graduate School (p. 50). 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 dissertation 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 outs ide and distinct disciplines. The student's three comprehensive exams will cover 48 credithours, including one SySc exam area of at least 16 credits, and two choice exam areas with at least 15 credits each.
All doctorals 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), doctoralstudents must pass their comprehensive exams consisting of three written exams and an oral exam by 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 multidis ciplinary option students, oneexam 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. After passing comprehensive exams, the student prepares a prospectus for dissertation research and recruits dissertation committee members under his or her adviser's supervision. An application is sent to the Graduate School, who will officially appoint the committee. Onceappointed, thechair of the committee becomes the student's adviser. The student then prepares a proposal for independent res earch 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 transfer credits) and all other conditions have been met (including IRB approval if human subjects are involved), thestudent is advanced to candidacy. PSU requires students to be advanced to candidacy with in 3 years of completing their comprehensive examinations.

Dissertation. Once the doctoral student has been advanced to candidacy, he or she completes the proposed dissertation work. Prior to their dissertation defense, doctoral students present their research at the Systems Science Seminar.

The candidate's finaldefense 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 dissertation is completed in one or two years after the proposal is approved. The formal defense 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 student can 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 graduatecertificates 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 cours es 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 graduatecertificate, 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 admission 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 TheGraduate School at least onetermbefore they apply for completion of the certificate.
Students notadmitted to the doctoralor 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 admission ifhis orher 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 Student Handbook 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: Neural Networks I

| Choose from the following: |  |  |
| :--- | :--- | :--- |
| CS 541 | Artificial Intelligence | 3 |
| CS 545 | Machine Learning | 3 |
| CS 546 | Advanced Topics in Machine | 3 |
|  | Learning |  |
| CS 570 | Machine Learning Seminar | 1 |
| ECE 510 | Topics:Mathematical | 4 |
|  | Foundations of Machine |  |
|  | 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. Typicalapplication areas include process engineering, policy evaluation, data analys is \& interpretation, and thestudy of feedback dynamics in complexsystems.

## DEGREE REQUIREMENTS

## Required Course

SySc 514 SystemDynamics

| At least one of the following two courses: |  |  |
| :--- | :--- | :--- |
| SySc 525 | Agent Based Simulation | 4 |
| SySc 527 | Discrete SystemSimulation | 4 |

Subtotal: 4-8

## Electives

One of the following courses if all three of the above courses are taken; otherwis etwo 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 | Introduction to 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 Social Sciences, Philosophy, Mathematics, Computer Science, Engineering, Public Adminis tration and Business, and to anyone with an interdis ciplinary focus. Systems ideas deepen our understanding of complexity and offer general 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 analysis 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, and | 4 |
| :---: | :---: | :---: |
|  | Systems Thinking |  |
| ESM 220 | Introductionto Environmental | 4 |
|  | Systems |  |
| ESM 221 | Applied Environmental Studies: | 4 |
|  | ProblemSolving |  |
| Geog 210 | PhysicalGeography | 4 |
| Geog 345U | Resource Management | 4 |
| Geog 380U | Maps and Geographic | 4 |
|  | Information |  |
| Phl 322U | Minds and Machines | 4 |
| Phl 470 | Philosophy of Science | 4 |
| Psy 413 | Ecopsychology | 4 |
| Sci 313U | Environmental Mathematical | 4 |
|  | Modeling |  |
| SySc 330U | Models in Science | 4 |
| SySc 332U | Introduction to Agent-Based | 4 |
|  | Modeling |  |


| SySc 334U | Modeling Social-Ecological Systems | 4 |
| :---: | :---: | :---: |
| SySc 336U | Networks and Society | 4 |
| SySc 338U | 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 | Exploring Complexity in | 4 |
| 346U/CS | Science and Technology |  |
| 346 U |  |  |
| SySc 350U | Indigenous and Systems | 4 |
|  | Perspectives onSustainability |  |
| SySc 399 | SpecialStudies | 4 |
| SySc 405 | Reading and Conference | -8 |
| SySc 409 | Practicum | -8 |
| SySc 410 | Selected Studies | -6 |
| SySc 411 | Systems Theory | 4 |
| SySc 413 | Holistic Strategies for Problem | 4 |
|  | Solving |  |
| SySc 414 | SystemDynamics | 4 |
| SySc 416 | Systems Thinking forBusiness | 4 |
| SySc 418 | SystemSustainability and | 4 |
|  | Organizational Resilience |  |
| SySc 421 | Systems Philosophy | 4 |
| SySc 423 | Systems Ideas and | 4 |
|  | Sustainability:Limits, Structural |  |
|  | Change, and Resilience |  |
| SySc 431 | Data Mining with Information | 4 |
|  | Theory |  |
| SySc 435 | Modeling \& Simulation with R and Python | 4 |
| SySc 440 | Introduction to Network Science | 4 |
| SySc 445 | ApplicationofData Science | 4 |
| SySc 452 | Game Theory | 4 |

## Women, Gender, and Sexuality Studies

150 Parkmill Building (PKM)
1633 SW Park Ave.
503-725-3516
www.pdx.edu/women-gender-s exuality-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 ofW omen, Gender, and Sexuality Studies offers an interdisciplinary program designed to foster students' personal and intellectual development and to prepare them for socially responsible citizenship as well as
a broad range of careers. Women, Gender, and Sexuality Studies advisers work closely with each student to craft a course ofs tudy appropriate to the student's academic interests and post-graduate goals.
An expanding field ofs cholarship, 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 criticalthinking skills and an appreciation for the rangeoftheoretical 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 wellas gender. Core courses also encourage students' active participation through discussion, informal as well as formal writing, and collaborative learning in the classroom.

The major in Sexuality, Gender, and Queer Studies (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 corecurriculumemphasizes queer and trans of color theorizing and critiques including queer indigenous, Two-Spirit, and transnational perspectives; critical analysis of the relationships between sexuality and other power formations such as gender, race, class, nation, ability, nature, citizenship, age, and size; his torical contexts and contemporary connections among rigorous theoretical, activist, political, and practiceoriented approaches; and an interdisciplinary, queer, and decolonial approach to analyses 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 developnew skills. Guidelines for women, gender, and sexuality studies practica and independent study are flexible in order to meet individual needs. Degrees in Women's Studies and Sexuality, Gender, and Queer Studies provide the foundations for life-long learning as well as background and experience for careers 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

Admis sionto 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 upperdivision 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 | Introductionto Women's Studies | 4 |
| UnSt 231 | Gender and Sexualities | 4 |
| WS 301 | Gender and Critical Inquiry | 4 |
| WS 305 | Women ofColorFeminist | 4 |
|  | Theory |  |
| WS 307 | Resistance, Activism, and Social Change | 4 |
| WS 315 | Feminist Analysis | 4 |
| WS 412 | Feminist Methodologies | 4 |
| WS 415 | Senior Seminar | 4 |
| Experiential learning (8 credits) |  |  |
| WS 409 | Practicum | 6 |
| WS411 | Experiential Learning Seminar | 2 |
| Electives ( $\mathbf{2 0}$ credits; with a minimum of $\mathbf{1 6}$ upperdivision credits) |  |  |
| WS 306U | Global Gender Issues | 4 |
| WS 308U | Topics in Gender, Literature, and Popular Culture | 4 |
| WS310U | Psychology ofWomen | 4 |
| WS312U | Feminist Philosophy | 4 |
| WS317U | Writing as Activism | 4 |
| WS 320U | Introduction to Girls' Studies | 4 |
| WS 330U | Women of Color in the United | 4 |

WS Women in the Middle East 4
331U/Intl
331U
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
WS 342U Women and Gender in the U.S. 1920 to the Present
WS 343U American Family History 4
WS 344U QueerEcologies 4
WS 346U/Bi Genes \& Society 4
346U
WS Science, Gender, and Social
347U/Sci
347 U
WS
348U/Sci
348 U
WS 351U
WS 360U
WS
365U/Sci
365U
WS 367U
WS 369U
WS 370U
WS 373/Phl
373
WS 374U
WS 375U
WS
372U/Eng
372 U
WS 377U
WS
379U/Phl
379U
WS 380U
WS 387 Feminist Organizations: Theory and Practice
WS410 Selected Topics
WS417 Women in the Economy 4
WS 424/PS Women and the Law 4
425
WS 425/Soc
425
WS 426/Soc
426
WS 428

| WS | Women in the Visual Arts | 4 |
| :---: | :---: | :---: |
| 431U/ArH |  |  |
| 431 U |  |  |
| WS 444 | British Women Writers | 4 |
| WS 445 | American Women Writers | 4 |
| WS 451 | Interrupting Oppression | 4 |
| WS | Genderand 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 471 | Transnational Feminisms | 4 |
| WS 479 | Women and Organizational | 4 |
|  | Psychology |  |
| WS 480 | Introductionto Critical | 4 |
|  | Disability Studies |  |
| WS 481 | Disability and Intersectionality | 4 |
| Anth 432 | Gender, Sex, and Sexuality in | 4 |
|  | Anthropological Perspective |  |
| BSt 342U | Black Feminism/Womanism | 4 |
| BSt 419 | A frican American Women in | 4 |
|  | America |  |
| ChLa 303U | Chicana/LatinaExperience | 4 |
| Intl360U | Bollywood: Communicating | 4 |
|  | Contemporary South Asia |  |
|  |  |  |
| 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 must complete 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 completethe 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 |  |  |
|  |  |  |
|  |  |  |
| REQUIREM ENTS |  |  |
| The major in Sexuality, Gender and Queer Studies (SGQS) is 56 credits. Those credits are divided as follows: |  |  |
| Core Courses (28 credits) |  |  |
| UnSt 231 | Gender \& Sexualities | 4 |
|  | or |  |
| WS 332U | Race, Class, Gender, and | 4 |
|  | Sexuality in the United States |  |

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 must complete a required core program ofapproved (wh 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:

## Core Courses ( 28 credits)

Gender \& Sexualities

| WS 360U | Introductionto Queer Studies | 4 |
| :--- | :--- | ---: |
| WS 370U | History of Sexualities | 4 |
| WS 381 | Queer ofColor Theorizing and | 4 |
|  | Perspectives |  |
| WS 412 | Feminist Methodologies | 4 |
| WS 415 | Senior Seminar | 4 |
| WS 482 | Topics in Transnational | 4 |
|  | Sexuality Studies |  |
| Experiential Learning Requirements (8 credits) |  |  |
| WS 409 | Practicum |  |
| WS 411 | Experiential Learning Seminar | 6 |

Electives ( 20 credits)

| 20 credits of |  | which 4 credits may be lower-division. |
| :--- | :--- | :--- |
| WS 305 | Women of Color Feminist | 4 |
|  | Theory |  |
| WS 308U | Lesbian Literature | 4 |
| WS 308U | Masculinities | 4 |
| WS 308U | Gender, Class, Culture | 4 |
| WS 344U | Queer Ecologies | 4 |
| WS | Science, Gender, and Social | 4 |
| 347U/Sci | Context |  |
| 347U |  |  |
| WS | Science, Gender, and Social | 4 |
| 348U/Sci | Context |  |
| 348U |  |  |
| WS | The Science of Gendered Bodies | 4 |

365U/Sci
365 U
WS Topics in Literature, Gender, and 4
372U/Eng Sexuality
372U
WS 373/Phl Queer Philosophy 4
373
WS 374U Memoir, Gender, and Sexuality 4
WS 375U Topics in Sexuality Studies 4
WS 382U TransgenderStudies 4
WS 481 Disability and Intersectionality 4
Anth 432 Gender, Sex, and Sexuality in 4
Anthropological Perspective
BSt 339U Afro-Futurisms/Black Science 4
Fiction
BSt 342U Black Feminism/Womanism 4
CFS 340U QueerFamilies 4
CFS 390U Sex and the Family 4
Comm 337U Communication and Gender 4
Comm Gender and Race in the Media
452/WS 452
PHE 335U Human Sexuality
PHE 453 Women's ReproductiveHealth
Phl369U Philosophy of Sex and Love
Psy 425 Psychology ofBlack Manhood in
America

| Psy 431U | Psychology of Men and <br> Masculinities | 4 |
| :--- | :--- | :--- |
| Soc 339U | Marriage and Intimacy | 4 |
| Soc 344U | Gender and Sexualities | 4 |
| WLL 349 | Forbidden Love | 4 |

Othervariable and special topic courses with a focus on sexuality may count as electives (e.g., FILM 370U Queer Cinema or Eng 494 Queer Theory); in these instances 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 $\mathrm{P} / \mathrm{NP}$ 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 | Introduction to Women's Studies | 4 |
| :--- | :--- | :--- |
|  | or |  |

UnSt 231 Gender and Sexualities
As well as two of the following courses:
WS 301 Gender and Critical Inquiry
WS 305 Women ofColorFeminist
4
Theory
WS 307 Resistance, Activism, and Social 4 Change
WS 315 Feminist Analysis 4
WS $412 \quad$ Feminist Methodologies 4

## Electives ( 16 credits)

Elective requirements may be fulfilled by any of the following core courses or by WS electives (see WS major electives listing(p.329)), including courses cross-listed with other departments or approved by a WS adviser.
WS 409 Practicum 6
WS $411 \quad$ Experiential Learning Seminar 2
WS 415 Senior Seminar 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 electivecourseor WS 409 Practicum.

## SEXUALITY, GENDER, AND QUEER STUDIES MINOR

The minor in Sexuality, Gender, and Queer Studies is an interdisciplinary programwhich 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 his torical 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 psychology of masculinities, the history of sexualities, and global is sues in sexualhealth.
The minor consists of 32 credits, including four core courses ( 16 credits) and 16 credits of electives:

## REQUIREMENTS

## Core Courses

| UnSt 231 | Gender \& Sexualities | 4 |
| :--- | :--- | :--- |
| WS 332U | Race, Class, Gender, and | 4 |
|  | Sexuality in the United States |  |
| WS 360U | Introduction to Queer Studies | 4 |
| WS 370U | History ofSexualities | 4 |

## Electives

Electives must have a focus relevant to sexuality, gender, and queer studies in order to count toward theminor.
Elective credit may be fulfilled by the following approved courses or by other courses approved by the faculty adviser for the minor where appropriate.

| Anth 103 | Introduction to Social/Cultural | 4 |
| :---: | :---: | :---: |
|  | Anthropology |  |
| Anth 432 | Gender, Sex, and Sexuality in | 4 |
|  | Anthropological Perspective |  |
| BSt 339U | Afro-Futurisms/Black Science | 4 |
|  | Fiction |  |
| BSt 342U | Black Feminism/Womanism | 4 |
| CFS 340U | QueerFamilies | 4 |
| WS 344U | Queer Ecologies | 4 |
| WS | Science, Gender, and Social | 4 |
| 347U/Sci | Context |  |
| 347 U |  |  |
| WS | Science, Gender, and Social | 4 |
| 348U/Sci | Context |  |
| 348 U |  |  |
| WS | The Science of Gendered Bodies | 4 |
| 365U/Sci |  |  |
| 365U |  |  |
| CFS 390U | Sex and the Family | 4 |
| Comm | Gender and Race in the Media | 4 |
| 452/WS 452 |  |  |
| Comm 410 | Sex and the Media | 4 |
| Eng 372U | Topics in Literature, Gender, and | 4 |
|  | Sexuality |  |
| Eng 494 | Topics in Critical Theory and | 4 |
|  | Methods |  |
| Eng 447 | Major Forces in Literature | 4 |


| Eng 441 | Advanced Topics in Renaissance Literature |
| :---: | :---: |
| PHE 335U | Human Sexuality |
| PHE 410 | Sex Education in America |
| PHE 410 | Worldview of Sexual Health |
| PHE 453 | Women's ReproductiveHealth |
| Phl 369U | Philosophy of Sex and Love |
| Psy 410 | Human Sexualities |
| Psy 425 | Psychology of Black Manhood in America |
| Psy 431U | Psychology of Men and Masculinities |
| Soc 339U | Marriage and Intimacy |
| Soc 344U | Gender and Sexualities |
| Span 410U | Selected Topics |
| Span 436 | Major Topics: Latin American Multiple Genres |
| WS 305 | Women of Color Feminist Theory |
| WS 308U | Topics in Gender, Literature, and Popular Culture |
| WS | Topics in Literature, Gender, and |
| $\begin{aligned} & 372 \mathrm{U} / \mathrm{Eng} \\ & 372 \mathrm{U} \end{aligned}$ | Sexuality |
| WS 373/Phl 373 | Queer Philosophy |
| WS 374U | Memoir, Gender, and Sexuality |
| WS 375U | Topics in Sexuality Studies |
| WS 381 | Queer of Color Theorizing and Perspectives |
| WS 382U | Transgender Studies |
| WS 482 | Topics in Transnational Sexuality Studies |
| 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 programad viser. |  |

## WOMEN'S STUDIES POST-BACCALAUREATE CERTIFICATE

The WS post-bac certificate consists of 24 required credits plus 16 approved upper-division electives for a total of 40 credits. In meeting the 16 elective credits, students may take a maximum of 12 credits in any oneacademic area (arts \& letters; science; social science).

## REQUIREMENTS

## Core Courses

| WS 301 | Gender and Critical Inquiry | 4 |
| :--- | :--- | :--- |
| WS 315 | Feminist Analysis | 4 |
| WS 412 | Feminist Methodologies | 4 |
| WS 415 | Senior Seminar | 4 |
| WS 409 | Practicum | 6 |

WS 411 Experiential Learning Seminar 2

## Electives (16 credits; see elective listing under WS

 major)> Approvedupper-division electives (minimum of 12 upperdivision)
Subtotal: 40
Total Credit Hours: 40
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, orWS 409.

## World Languages and Literatures

315 FariborzMaseeh Hall (FMH)
503-725-3522
world@pdx.edu
www.pdx.edu/world-languages

- B.A.-Concentration in Arabic, French, German, Japanese, Russian, 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, Spanish, or Turkish (Pleasenote, applications for the concentration in Chinese are not being accepted at this time.)
- Minor in ClassicalStudies
- Certificate in Intercultural Competence for the W orkplace
- Certificate in Teaching Japanese as a Foreign Language
- Certificate of Advanced Proficiency in Russian
- Certificate in World LanguagePedagogy
- Secondary Education Program
- M.A.-W orld Language: German, Japanese, or Spanish (Please note, the MA in French has been suspended effective fall2020, 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 (Please note, the MA in French has been suspended effective fall 2020, and no applications are being accepted at this time.)


## Foreign Language Requirements

At Portland StateUniversity, all incoming students who graduate froman Oregon high school in 1997 or latermust
demons trate proficiency in a second language as an admission requirement. And most BA orMA programs require students to achieve proficiency in a foreign language as a degree requirement. Students may satis fy 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 satis fy the language requirement through transcripted university 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 CPL for 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, Pers ian, Portuguese, Rus sian, 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 receivecredit 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, Turkish, and Clas sicalStudies; 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 fromtime 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-approved 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 must include at least one course fromthe $341,342,343,344,345$ sequence and a minimum of 16400 -level credits in their total program.

## REQUIREMENTS

## Courses

## Language, literature, and culture ( $\mathbf{3 2}$ credits)

(in Fr this must include two courses fromthe 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)
400-level courses in the major language ( 8 credits)
(excluding 401-410, except for Fr which accepts 401-410)

## Advis er-approved electives (8 credits)

Linguistics (4 credits)
WLL 390 Languages of the World
Ling 390 Introduction to Linguistics
or
a linguistics course in the major language
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 (Cooperative Education) 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 satis fy major requirements mustbe passed with a grade of C or 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 W orld Languages and Literatures offers undergraduate minors in American Sign Language (ASL), Arabic, French, German, Italian, Japanese, Modern Hebrew, Persian, Russian, Spanish, and Turkish. (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, and 4 credits in generallinguistics (WLL 390, Ling 390, or a linguistics course in the target language).

## REQUIREMENTS

## Courses

$$
\begin{array}{lr}
\text { Language, literature and culture } & 20 \\
\text { Linguistics } & 4
\end{array}
$$

- 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 satis fy 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 satis fy 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 fromthe list below.

## REQUIREMENTS

## Language: 24 credits of Latin

Two years of Latin

## Area Classes ( $\mathbf{1 6}$ credits)

| ArH 352U | Ancient Greek Art and <br> Architecture <br> Ancient Roman and Etruscan <br> Art and Architecture | 4 |
| :--- | :--- | :--- |
| Eng 317U | Greek Mythology |  |
| Grk 330U | Ancient Epic: Glory and <br> Memory | 4 |
| Grk 332U | Gods and Mortals: Harnessing | 4 |
| Grk 333U | the Divine |  |
| Grk 335U | Tragedy, Fate, and Fragility | 4 |
| Grk 336U | Ancient Laughter: Ridicule and <br> the Absurd | 4 |
| Hst 309U | The Roman Republic | 4 |

Hst 310U The Roman Empire 4
Hst 315U History of Ancient Greece 4
Hst 316U Roman History 4
JSt Pagans, Christians and Jews
378U/Hst
378U
Lat 330U Roman Culture 4
Lat 341 U Roman Literature in Translation 4
Phl301U Ancient Philosophy 4
Phl414 Plato 4
Phl 415 Aristotle 4
TA 471 Theater History: Periods and 1-4 Topics
Subtotal: 40

- Twelve of the required 40 credits must be taken in residenceat PSU.
- All courses used to satis fy minor requirements must be graded Corhigher. Students minoring in classical studies must maintain a minimum GPA of 2.50 in all courses used to satis fy the minor requirements.


## INTERCULTURAL COMPETENCE FOR THE WORKPLACE UNDERGRADUATE CERTIFICATE

The Certificate in Intercultural Competence for the W orkplace offers a focused trajectory of cours ework options designed to enhance intercultural competence in professional and workplace settings. The required 16-27 credits (total number ofcredits varies according to the language a studentstudies 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 W orkplace 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 4 Professional Contexts

Subtotal: 4

AREA 3: ONE OF THE FOLLOWING:

|  |  |  |
| :--- | :--- | :--- |
| Comm 215 | Introduction to Intercultural | 4 |
| Int1 | Communication |  |
| Understanding the International <br> 471 | 4 |  |

Subtotal: 4

## AREA 4: ONE OF THE FOLLOWING CLASSES ON SKILLS FOR THE GLOBALINTERNATIONAL 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 Politics | 4 |
| :---: | :---: | :---: |
| CR 307 | Conflict Management Skills | 4 |
| CR 312 | Intercultural Conflict Resolution | 4 |
| CR 423 | Dialogue Across Differences | 4 |
| CR 441 | Storytelling and Conflict | 4 |
|  | Resolution |  |
| Fin 456 | International Financial | 4 |
|  | Management |  |
| Fr 320 | French for the Working World | 4 |
| Ger 320 | German for the Working World | 4 |
| GSCM 439 | Global Sourcing and Negotiation | 4 |
| Intl | Gender and International | 4 |
| $\begin{aligned} & 349 \mathrm{U} / \mathrm{WS} \\ & 349 \mathrm{U} \end{aligned}$ | Development |  |
| Int1375U | Global Migration | 4 |
| Int1380U | Globalization, Representation and Difference in Media and Film | 4 |
| Int1470 |  | 4 |
|  | Change | 4 |
| Jpn 413 | Advanced Japanese: Japanese for the Real World | 4 |
| Jpn 477 | Teaching Japanese As a Foreign | 4 |
|  | Language |  |
| Mgmt 446 | Principles ofInternational | 4 |
|  | Management |  |
| Mktg 376 | International Bus iness | 4 |
| Mktg 466 | Principles ofInternational | 4 |
|  | Marketing |  |
| NAS 348 | Indigenous Practices for | 4 |
|  | Environmental Sustainability |  |
| NAS 411 | Nationhood: Tribal Sovereignty, Governance \& Policy | 4 |
| PHE 444U | Global Health | 4 |
| PS 352U | Introductionto European Politics | 4 |


| PS 353U | Introductionto Latin American Politics | 4 |
| :---: | :---: | :---: |
| PS 354U | Introductionto Asian Politics | 4 |
| PS 355U | Introductionto African Politics | 4 |
| PS 361U | Introduction to the Politics of the Middle East | 4 |
| Psy 343 | Social Psychology: Social Relationships and Groups | 4 |
| Psy 361 | Industrial Psychology | 4 |
| Psy 362 | Organizational Psychology | 4 |
| Psy 426 | Psychology of Stigma \& Social Inequality | 4 |
| Psy 470 | Diversity in the Workplace | 4 |
| Span 313 | Business \& Culture in the Hispanic World | 4 |
| Span 314 | Spanish in Social and Legal Services | 4 |
| Span 316 | Spanish and Medical Culture | 4 |
| Span 317 | Spanish for Agriculture Purposes | 4 |
| USP 301U | Introductionto Community Development | 4 |
| USP 317U | Introductionto International Community Development | 4 |
| USP 326U | Neighborhood Conservation and Change | 4 |
| $\begin{aligned} & \text { USP } \\ & \text { 419/Soc } 441 \end{aligned}$ | Populationand Society | 4 |
| WS 331U/Intl 331U | Women in the Middle East | 4 |
| WS | Genderand International | 4 |
| $\begin{aligned} & 349 \mathrm{U} / \text { Int1 } \\ & 349 \mathrm{U} \end{aligned}$ | Development |  |

Subtotal: 4
Total Credit Hours: 16-27
At least 12 credits towards the certificate mustbe taken at PSU.

All courses used to satis fy certificaterequirements must be passed with a grade of Cor higher. (C- and P are not acceptable.)

## WORLD LANGUAGE PEDAGOGY 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 other fields, 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 orpublic K-16 school in the US, or intend to apply to GTEP or other teacher education programs. Candidates may enroll as undergraduate or post-
baccalaureate students. The certificate will be available in the following languages: Arabic, Chinese, French, German, Italian, Japanese, Pers ian, Russian 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 them through 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 ofproficiency is determined by each language section. Students will have an adviser for the certificate who will guide them through 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 totalof 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 | 4 |
| :--- | :--- | :--- |
| Jpn 478 | Language <br> Teaching Japanese As a Foreign | 4 |
|  | Language |  |
| Span 312 | Introduction to Teaching Spanish | 4 |
| WLL498 | Methods of Teaching Foreign | 4 |
|  | Languages |  |
| Ling 477 | TESOL Methods I | 4 |
| Ling 438 | Second Language Acquisition | 4 |

## Area 2: Linguistics (4 credits)

Students will take one linguistics 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 from Applied Linguistics (Ling 390, Ling 438) may be taken to meet this requirement. Ling 438 can only be applied to Area 1 or Area 2.

| Ar 414 | Advanced Arabic Grammar | 4 |
| :--- | :--- | :--- |
| Ar 490 | History of the Arabic Language | 4 |
| Chn 490 | History of the Chinese Language | 4 |
| Fr 325 | French Phonetics and Phonology | 4 |
| Fr 414 | Advanced French Grammar | 4 |
| Fr 490 | History of the French Language | 4 |
| Fr 494 | French Linguistics | 4 |
| Fr 497 | Applied French Linguistics | 4 |
| Ger 414 | Advanced German Grammar | 4 |
| Ger 490 | History of the German Language | 4 |
| Ger 494 | German Linguistics | 4 |

Ar414
History of the Arabic Language
Ar 490
History of the Chinese Language
Fr $325 \quad$ French Phonetics and Phonology
Fr 414 Advanced French Grammar
Fr $490 \quad$ History of the French Language
Fr 494
French Linguistics
Fr 497
Advanced German Grammar
Ger 490 History of the German Language
Ger 494
German Linguistics

Ger 497 Applied German Linguistics 4
It 390 History of Italian Language
Jpn 414 Advanced Japanese Grammar 4
Jpn 494 Japanese Sociolinguistics 4
Rus 325 Russian Phonetics and 4
Rus 414 Advanced Russian Grammar 4
Rus 494 Russian Linguistics 4
Rus 497 Applied RussianLinguistics 4
Span 414 Advanced Spanish Grammar 4
Span 490 History of the Spanish Language 4
Span 494
Span 497
WLL 390
Span 498
Ling 390
Ling 438
4

4

Applied SpanishLinguistics 4
Languages of the World 4
Spanish Syntax 4
Introductionto Linguistics 4
Second Language Acquisition 4

## 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 W orld Languages and Literatures.

## Area 4: Practicum (4 credits)

Students will complete 4 credits of Practicumin the world language oftheir choice (Arabic, Chinese, French, German, Italian, Japanese, Pers ian, Russian, or Spanish). The total of 4 credits can be taken allat once or over multiple terms. At least 1 credit hour of practicumshould involve instructionalexperience 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 ("Japaneseand 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 outsideofPSU's program, and credits earned through study abroad at a PSU's partner institution will be considered as residential credits.
Subtotal: 20
Total Credit Hours: 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 require ments

Students who wish to complete the Certificate program must first be admitted to the Russian Flagship Program (RFP). Sponsored by The LanguageFlagship, RFP offers both Introductory and Advanced tracks. See www.pdxedu/russian-flagship/ for details.

## COURSE REQUIREMENTS

Students in the programtake five advanced Russian classes, three content classes conducted in Russian, and six Russian across the curriculumclasses attached to the students' generaleducation requirements and individual majors. Students completetheir Senior Capstone in Russian.
Courses
Advanced Russian Language Classes (5 classes):

| Rus 325 | Russian Phonetics and <br> Phonology | 4 |
| :--- | :--- | :--- |
| 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 ( $\mathbf{3}$ classes) chosen from:

| Rus 421 | Topics in Contemporary Russian <br> Rus 427 | Culture <br> Topics in Russian Literature of <br> the 19th Century |
| :--- | :--- | :--- |
| Rus 433 | Topics in Russian Literature of <br> the 20th Century | 4 |

Subtotal: 12

## Russian Across the Curriculum:

| Rus 444 | Flagship Studies: Globalization <br>  <br>  <br> Term 1 |
| :--- | :--- |

Rus 445 Flagship Studies: Globalization 2
Rus 446 Flagship Studies: Globalization 2 Term 3
Rus 454 Flagship Studies:American

UnSt 421
Capstone 6
Subtotal: 24
Subtotal: 56

## Total Credit Hours: 56

- All courses used to satis fy CAPR certificate requirements must be graded Cor 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 ocial sciences. Candidates may enroll as post-baccalaureate students or while completing undergraduate degree requirements in another field.

## Admission require ments

1. Admissionto Portland State University.
2. Japanese proficiency at the ACTFL Intermediate High level.

Students whose proficiency is lowermay 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 W orld 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

Area Studies 16
TJFL Methods
Subtotal: 40
All courses used to satis fy certificate courserequirements must be gradedCorabove.

## FOREIGN LANGUAGE SECONDARY EDUCATION PROGRAM

Advisers: French, S. Walton; German, K. Godfrey;
Japanese, S. Watanabe; Russian, W. Comer; Spanish, E. Nunez.
Students who wish toteach a foreign language in Oregon secondary schools must be admitted in to the Graduate Teacher Education Program(GTEP) in Portland State's College of Education and complete the requirements for an

Oregon Teaching License. Admission to GTEP as a foreign-language specialist requires a bachelor's degree or equivalent preparation in a world language taught in Oregon schools and the recommendation of the Department of W orld Languages andLiteratures. 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 admission to the Graduate Teacher Education Programin the College of Education (see Graduate Teacher Education Program(p. 146)).
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 ACTFL scale in French, German, or Spanish, or a rating of Intermediate High or higher in Japanese or Russian.

The Department of W orld Languages and Literatures highly recommends that applicants earn upper-division credits in their chosen language beyond the minimumof 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 andCivilization, 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. Admission 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 admis sion must meet the University admissions requirements (p. 8).

## Master of Arts in World Language

Applicants for admission 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 mustalso meet the following departmental requirements:

1. 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
2. In the secondary language: Demonstration of third-year proficiency.

## DEUTSCHE SOMMERSCHULE AM PAZIFIK

Graduate credits earned in German through theDeutsche Sommers chule amPazifik (DSaP) can be accepted as inres idence credit at Portland State University only if taken after formal admission 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 admission to either programis normally limited to 15 credits, in accordance with the University's transfer regulations.

An M.A. degreein German earned solely by attendance at the Sommers chule normally entails four summers' work plus thesis.

## 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 fall 2020, and no applications are being accepted at this time. 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 residenceafter admis sion to the degree program. The 45 credits are to be dis tributed as follows:

## REQUIREMENTS

## Thesis option

WLL 560
Principles of Scholarly Research
4
WLL 598 Methods of Teaching Foreign 4

| 503 | Thes is | 6-9 |
| :---: | :---: | :---: |
|  | Additional adviser-approved 500-level cours ework | $\begin{array}{r} 20- \\ 23 \end{array}$ |
| Credits from 551,552,553 |  |  |
|  | from 551, 552, 553 |  |
| 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 |
|  | Additionaladviser-approved 500-level cours ework | $\begin{array}{r} 20- \\ 23 \end{array}$ |
| Credits from 551,552,553 |  |  |
|  | Eight graduate credits chosen from 551, 552, 553 | 8 |

Subtotal: 45
Note: The student's programmay include, with 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 forMaster's Degrees.
In addition to the required coursework, the candidate will have to:

- Thesis option: Submit a thesis, 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 oral examination.

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, Japanese, or Spanish; the secondary language may be Arabic, Chinese, French, German, Japanese, Russian, or Spanish. Admission to the MA in French has been suspended effective fall 2020, and no applications are being accepted at this time.

## REQUIREMENTS

A minimum of 60 credits, of which 40 must be earned in residence, dis tributed among the following areas:

| Primary language |  |  |
| :---: | :---: | :---: |
| General |  |  |
| Credits from 551,552, 553 |  |  |
|  | Eight graduatecredits chosen from 551, 552, 553 | 8 |
| Other |  |  |
|  | Other adviser-approved 500levelcourses | 16 |
|  | Sub | : 28 |
| Secondary language |  |  |
| Eight graduate credits chosen from: |  |  |
| 511 | Advanced Language | 4 |
| 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), the equivalent 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
WLL 598 Methods of TeachingForeign 4
Fr 590 History of the French Language 4
Ger 584 German Stylistics 4
Ger 594 German Linguistics 4
Ger 597 Applied German Linguistics 4
Jpn 552 Japanese Language and 4
Linguistics
Jpn 577 Teaching Japanese As a Foreign 4
Jpn 578 Teaching Japanese As a Foreign 4
Language
Jpn 594 Japanese Sociolinguistics 4
Span 590 History of the Spanish Language 4
Span 594 Spanish Linguistics 4
Span 597 Applied SpanishLinguistics 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 final comprehensive written and oral examination over coursework taken in the primary and secondary areas and over the res earch papers.


# OHSU-PSU School of Public Health 

David Bangsberg, Dean
Karen Camp, AssociateDean for Financeand Administration
Rick Johnson, Associate Dean for Academic Affairs
Marguerita Lightfoot, Associate Dean for Research Lynne Messer, Assistant Dean for Graduate A cademic Affairs
Dawn Richards on, Associate Dean for Social Justice Liana Winett, Associate Dean for Student Affairs \& Community Engagement
Belinda Zeidler, AssistantDean for Undergraduate Academic Affairs
ohsu-psu-sph.org

- B.A., B.S. -Public Health Studies, Applied Health and Fitness
- Undergraduate Certificate 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 <br> 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 nationalmodel for community engagement and academic innovation. Together, the two universities offer unmatched opportunity forstudents to learn in the classroom and apply that knowledge and in real-world settings.

## Access \& Equity

$A$ vision of health equity
One ofour top goals is to increase the number of underserved and his torically 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 ourmission is to be an access university, we take pride in the number of students we accept, nothow many we reject.

## Value <br> 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 <br> 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 disparities. 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 ofopportunity for internships, hands-on learning and contacts for future employment.

## Affordability

An affordable degree with excellent ROI
The cost of a degree from the OHSU-PSU School of Public Health is among the lowestin 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 EPI 612 Epidemiology I and PHE 511 Foundations of Public Health as electives.
For more information and instructions on how to apply vis it the PhD in Community Health web page.

## DEGREE REQUIREMENTS

| Health Core |  |  |
| :--- | :--- | :--- |
| PHE 612 | Principles of Health Behavior | 3 |
| PHE 546 | Urban and Community Health | 3 |
| PHE 622 | Health and Social Inequalities <br> PHE 623 | 3 |
| Doctoral Seminar in Health |  |  |
| PHE | Research <br> Teaching and Learning in Health | 3 |
| 626/SW 626 | Promotion \& Social Work | 3 |
| 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 |
|  | Epidemiology | 3 |
| HSMP 681 | PopulationHealth: Policy and <br> Practice Implications | 3 |
| PHE 619 | Mentored Teaching Experience | 4 |

Subtotal: 37
Students are required to be enrolled in the 1-credit per quarter PHE623 DoctoralSeminar in Health Research for a total of 6 credits during the first two years (6quarters) of
the program. The Doctoral Seminar in Health Research will meet weekly with a faculty instructor on topics such as the critical evaluation of health research, hypothesis generation, publication and review process, grant application process, and programrequirements.

| Methods Core |  |  |
| :--- | :--- | :--- |
| PHE 520 | Qualitative Research Design | 3 |
| PHE 624 | From Philosophy through Power <br> Calculations: Writing Methods <br> Pections for ResearchProposals | 3 |
| PHE 625 | Advanced Methods Toolkit: <br> Design, Sampling, Scale <br> Development, \& More <br> PHE 634 |  <br> Theory |
| Bsta 611 | Estimation and Hypothesis | 3 |
| 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 socialscience research methods. Competencies will include study design, sampling, measurement, evaluation, qualitative research and analysis.

## Electives

## Methods Electives

In addition to the required methods courses, students must enroll in at least 6 credits ofmethods electives. Elective course selections must be approved by thestudent's advisor.

## Substantive Area Electives

Students must also take at least 12 credits ofelectives on health topics related to whichever of the three defined areas of emphas 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 finished all required and elective cours ework. For full-time students, this exam is expected to take place during the fall term of the student's third year. Scheduling of this exam for 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 willhelp guide
the preparation of the dis sertation proposal. After committee approval of the student's written and oral presentation of a dis sertation 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 dissertation and successful oral defense of the dissertation, to be eligible for graduation. The PHE 603 Dissertation credits are byarrangement credits supervised by the PHE advis or or the dissertation chair (faculty within PHE). Continuous reg is tration with a minimum of 1 PHE 603 Dissertation credit is required while engaged in dissertation res earch.

Subtotal: 27

## Total Credit Hours: 108

## Other Professional Development

The core curriculumhas a strong emphasis on community engagement, research mentorship, critical evaluation of research, and professionaldevelopment. 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, workshops, 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 estimation of dis ease 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 thecauses and prevention ofdisease 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 independentres earch 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.

Students graduating fromthis programwill be able to:
Apply population-based concepts of chronic and infectious dis ease epidemiology with in 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 statistical 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 arise in 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.

Demonstrate 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 vis it the PhD in Epidemiology web page.

## CORE REQUIREMENTS

## Epidemiology Core

Epi 613 Epidemiology II 4
Epi 614 Epidemiology III 4
Epi 636 EpidemiologicalData Analysis \& 4
Epi 630 Epidemiology Journal Club 1
Epi 610 Epidemiology Doctoral Seminar 3
Epi 640 Research Proposal and Design 3
Epi 668 Infectious Dis ease Epidemiology 2
Epi 676 Chronic DiseaseEpidemiology 2
Subtotal: 24

## Biostatistics Core

Bsta $612 \quad 4$
Bsta 613 CategoricalData Analysis 3
Bsta 515 Data Management \& Analysis in 3 SAS

Bsta $514 \quad$ Statistical Analysis ofTime-to- 3 Event Data
or

| Bsta 519 | Applied Longitudinal Data Analysis | 3 |
| :---: | :---: | :---: |
| Subtotal: 14 |  |  |
| Public Health Core |  |  |
| Conj 650 | Scientific Ethics | 1 |
|  | or |  |
| 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 |
| HSMP 674 | Health Health Systems Organization | 3 |

Subtotal: 13-15

| $\substack{\text { Mentored } \\ \text { Epi } 660}$ | Teaching <br> Mentored Epidemiology <br> Teaching | 1 |
| :--- | :--- | :--- |

Subtotal: 1

## Epidemiology Dissertation

Epi 603 Epidemiology Dissertation 27-
Credits 29
Subtotal: 27-29

## ELECTIVES

## Methods Electives

Courses chosen frompre-ap proved list or in consultation with program director and advisor.

- No more than 6 of 12 required credits canbe met with Epi 650 Mentored Epidemiology Research.
- Courses selected relevant to course ofstudy and necessity to meet credit requirements.
- Courses must be choseso 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 ofstudy and necessity to meet credit requirements.

Courses must be chosen so that programrequirements are met with no more than 27 credits (required pluselective) at the $500-\mathrm{level}$.

## Subtotal: 15-17

Dissertation 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 programofstudy. It is administered through the OHSU - PSU School of Public Health and draws on faculty with educational backgrounds 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 program is 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 masterthe 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 ofs cholarly activities to academic and lay audiences.

The HS\&P curriculumreflects the vision, mission and competencies of the OHSU-PSU Schoolof 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 the expectations 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 visit 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. All students are required to fulfill prerequis ite 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 seminar each 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 dissertation preparation. Additional major requirements include a written and oral comprehensive examat the completion of course requirements and before advancement 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-
Health systems courses
Research design and Analytic 19-
methods 23
Dissertation seminar 6
Dissertation credits 27

Subtotal: 103-111
Each admitted student's past masters coursework will be reviewed upon admission and a determination made regarding waiverof courses. A programof study will then be developed with the assigned advisor. No waiverof credit will be given for professional experience.

## Core coursework

The required core courses ( 21 credits) should be completed early in the programof study.

| HSMP 642 | Organizational Theory and <br> Health Systems | 3 |
| :--- | :--- | :--- |
| HSMP 671 | Health Policy | 3 |
| HSMP 673 | Values and Ethics in Health | 3 |
| HSMP 674 | Health Systems Organization | 3 |
| HSMP 677 | Health Care Law and Regulation | 3 |
| HSMP 686 | Introduction to Health | 3 |
|  | Economics |  |
| HSMP 660 | Contemporary Research in | 3 |
|  | Health Systems and Policy |  |

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 websiteand in the HS\&P programguide.

| HSMP 675 | Advanced HealthPolicy | 3 |
| :--- | :--- | ---: |
| PAP 616 | Policy Process | 3 |
| USP 615 | Economic Analysis of Public <br> Policy <br> or | 4 |
| HSMP 683 |  <br> Policy | 3 |
|  | 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 | PopulationHealth: Policy and <br> Practice Implications | 3 |
|  | Two health systems electives | 6 |

HSMP681 PopulationHealth:Policy and 3
Two health systems electives

## 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.

| HSMP 689 | Research Design in Health <br> Soc 638 | Services <br> Integrating Qualitative and <br> Quantitative Methods |
| :--- | :--- | ---: |
| PHE 520 | Qualitative Research Design | 4 |
| USP 683 | or |  |
|  | 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 them for 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 res earch 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 Doctoral Seminar may be taken forup 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 dissertation. 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 cons ists of three HS\&P/SPH faculty.

## Dissertation res earch

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 dissertation committee consists of 4-5 relevant HS\&P or SPH faculty, and one external member. Students register for HSMP 603 Dissertation 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 assistants hips

Dependent on available funds, graduateres earch assistantships 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 completea plan ofstudy that prepares themto pursue a doctoral degree in a healthrelated area.

The School of Public Health offers eight graduate degrees.

1. A Master ofPublic Health (M.P.H.) degree in Health Promotion.
2. A Master ofPublic Health (M.P.H.) degree in Health Managementand Policy.
3. A Master of Public Health (M.P.H.) degree in Biostatistics
4. A Master ofPublic 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 ofPublic 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 experienceare 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 esesearch 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 statistical methods 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 properpublic 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 strategies for interpretation of data in the larger cultural context.


## CORE REQUIRED COURSEWORK (22 CREDITS)

| Bsta 511 | Estimation and Hypothesis <br> Testing for Applied 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 | Pass |
|  | Examination |  |


| Bsta 502 | Integrative Learning Experience <br> and Paper | 1 |
| :--- | :--- | ---: |
| Bsta 509 | Integrative Learning Experience | 4 |
| Exam | Biostatistics Comprehensive <br> Examination | Pass |
| PROGRAM REQUIRED COURSEWORK (28 |  |  |
| PREDITS) |  |  |


| UNI 504 | Qualitative Methods for Health <br> Professionals | 2 |
| :--- | :--- | :--- |
| Bsta 512 | Linear Models |  |
| Bsta 513 | CategoricalData Analysis | 4 |
| Bsta 515 | Data Management \& Analysis in | 3 |
|  | SAS |  |
| Bsta 516 | Design and Analysis ofSurveys | 3 |
| Bsta 519 | Applied Longitudinal Data | 3 |
| HSMP 573 | Analysis | Values and Ethics in Health |
| Epi 513 | Epidemiology II | 3 |
| Epi 566 | Current Issues in Public Health | 4 |

## ELECTIVE COURSES FROM THE FOLLOWING (10 CREDITS)

| Bsta 500 | Reading and Research in | 1-3 |
| :---: | :---: | :---: |
|  | Biostatistics |  |
| Bsta 514 | Statistical Analy sis ofTime-to- | 3 |
|  | Event Data |  |
| Bsta 517 | Statistical Methods in Clinical | 3 |
|  | Trials |  |
| Bsta 521 | Bayesian Methods forData | 3 |
|  | Analysis |  |
| Bsta 522 | StatisticalLearning and Data | 3 |
|  | Science |  |
| Bsta 523 | Design and Analysis of | 3 |
|  | Experimental Designs |  |
| Bsta 524 | Statistical Methods for Next Gen | 3 |
|  | Sequencing |  |
| Bsta 550 | Intro to Probability | 3 |
| Bsta 551 | Statistical Inference I | 3 |
| Bsta 552 | Statistical Inference II | 3 |
| Epi 514 | Epidemiology III | 4 |
| PHE 519 | Introduction to the Etiology of | 3 |
|  | Disease |  |

## Total Credit Hours: 60

For more information and instructions on how to apply to the program visit 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 environment 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 onhumanhealth, environmental pathogens, environmental transport, fate and remediation ofchemical contaminants, food web bioaccumulation, wastewater treatment, environmentalrisk assessment and toxicity testing, culturally competent risk communication, and social justice is sues. Within the programspecial attention will be given to mediating and modifying the effects of environmental disruptions on the health of vulnerable populations in a culturally competent, ethicalmanner.

## Program Competencies

Students graduating fromthis programwill be able to:

- Communicate the relationship between environmental systems and human health, particularly in response to a changingclimate.
- 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 and environmental hazards.
- Evaluate the risk of environmental exposures to human populations through the incorporation of exposure, toxicological, and other relevant data into risk assessment methodology.
- Discuss how federal and state regulatory programs, guidelines and authorities impact environmental and occupational health 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 mechanisms of toxicity in eliciting a human health effect in response to various environmental and occupational exposures.

| Program Required Cours ework  <br> UNI 504 Qualitative Methods for Health <br> Professionals <br> EnvironmentalHealth in a <br> ESHH 519 Changing World <br> ESHH 529  <br> Risk Assessment <br> ESHH 521Principles of Occupational |  |  |
| :--- | :--- | :---: |
| HSMP 573 | Health <br> Values and Ethics in Health | 4 |

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

## Elective Coursework

Electives commonly taken:

| ESHH 512 | Global \& Planetary Health Concepts | 3 |
| :---: | :---: | :---: |
| ESHH 530 | Environmental Health Chemis try | 4 |
| ESHH 532 | Ecological Public Health |  |
| CPH 515 | Geographic Information Systems for Public Health | 3 |
| Epi 513 | Epidemiology II | 4 |
| Epi 514 | Epidemiology III | 4 |
| 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 540 | Mass Media and Health | 3 |
| ESM 552 | Environmental Regulation and | 3 |
|  | Non-regulatory Approaches |  |
| ESM 570 | Methods for Informal | 4 |
|  | EnvironmentalEducation |  |
| ESM 588 | Environmental Sustainability | 4 |
| Geog | Geographic Information Systems | 4 |
| 588/USP | I: Introduction |  |
| Geog | Geographic Information Systems | 4 |
| 592/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 |

Subtotal: 22

## Total Credit Hours: 60

For more information and instructions on how to apply vis it the MPH in Environmental Systems \& Human Health web page.

## EPIDEMIOLOGY MPH

Graduates of the OHSU-PSU SchoolofPublic Health MPH in Epidemiology work to reduce disease risk and promote health by discovering 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 directstudies and analyze data as well as communicate findings to the public and policy makers.

## Program Competencies

Students graduating fromthis programwill be able to:

- Apply population-based concepts ofepidemiology and risk determination to the assessment ofhealth 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 research hypothesis.
- Identify ethical principles problems that arise in public health policy decis ions.
- 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 issues 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
Testing for Applied Biostatistics
Epi $512 \quad$ Epidemiology I
ESHH 511 Concepts of Environmental
Health

| HSMP 574 | Health Systems Organization |  |
| :---: | :---: | :---: |
| PHE 512 | Principles of Health Behavior |  |
| Exam | Certified in Public Health |  |
|  | Examination |  |
| Epi 502 | Integrative Experience Paper |  |
| Epi 504 | Practice Experience |  |
| Program Required Cours ework (27 credits) |  |  |
| Bsta 512 | Linear Models |  |
| Bsta 513 | CategoricalData Analysis |  |
| Epi 513 | Epidemiology II |  |
| Epi 514 | Epidemiology III |  |
| Epi 536 | EpidemiologicalData Analysis \& Interpretation |  |
| Epi 566 | Current Issues in Public Health |  |
| HSMP 573 | Values and Ethics in Health |  |
| UNI 504 | Qualitative Methods for Health Professionals |  |
| Commonly taken elective courses* (11 credits) |  |  |
| Bsta 514 | Statistical Analysis of Time-toEvent Data |  |
| Bsta 515 | Data Management \& Analysis in SAS |  |
| Bsta 516 | Design and Analysis ofSurveys |  |
| Bsta 517 | Statistical Methods in Clinical Trials |  |
| Bsta 519 | Applied Longitudinal Data Analysis |  |
| CPH 515 | Geographic Information Systems for Public Health |  |
| CPH 521 | SocialDeterminants of Health |  |
| Epi 505 | Reading and Conference | 1-3 |
| Epi 540 | Introduction to Research |  |
|  | Proposal and Design |  |
| Epi 556 | HIV/AIDS Epidemiology |  |
| Epi 568 | Infectious Disease Epidemiology |  |
| Epi 576 | Chronic Dis easeEpidemiology |  |
| Epi 630 | Epidemiology Journal Club |  |
| HSMP 581 | Population Health: Policy and Practice Implications |  |
| PHE 519 | Introduction to the Etiology of Disease |  |
| PHE 522 | Health and Social Inequalities |  |
| PHE 532 | Developmental Origins of Health and Disease (DOHaD)Epidemiology |  |
| PHE 534 | Social Epidemiology Methods \& Theory |  |
| * Other courses may be approved by the MPH Epi 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 adminis trative 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 effectiveverbal, written and interpersonal communication and mes saging 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, system stakeholders, 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 developmentand 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 leadership skills to address health systemmanagement and policy issues.


## REQUIREMENTS

Students admitted to the health management and policy M.P.H. degree are required to complete 62 hours of coursework. Ins truction is provided at Portland State University and Oregon Health \& Science University. Students are required to pass theCertified in Public Health ( CPH ) examination before graduation.

| Core courses (17) |  |  |
| :--- | :--- | :--- |
| PHE 512 | Principles of Health Behavior | 3 |
| Bsta 525 | Introductionto 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 cours es(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 |  |
| Elective credits from the following list (15): |  |  |
| PA 525 | Grantwriting forNonprofit | 3 |
|  | Organizations |  |
| PA 543 | Creating Collaborative | 3 |
|  | Communities |  |
| PA 545 | Organizational Development | 3 |
| PA 549 | Cross-cultural Communication in the Public Sector | 3 |
| PA 553 | Sustainable DevelopmentPolicy and Governance | 3 |
| PA 554 | Policy Analysis Research | 3 |
| PA 556 | Public Contract Management | 3 |
| PA 558 | Managing Public Projects and | 3 |
|  | Programs: FromLocal to Global |  |
| HSMP 544 | Leadership and Governance in | 3 |
|  | Health Services |  |
| HSMP | Health Administration | 3 |
| 570/PAH |  |  |
| 570 |  |  |
| HSMP 572 | Health Politics | 3 |
| HSMP 575 | Advanced Health Policy | 3 |
| HSMP 578 | Performance Improvement in | 3 |
|  | Health Services |  |
| HSMP 579 | Health Information Technology and Systems Management | 3 |
| HSMP 580 | 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 cours es may be approved by the adviser. |  |  |
| Field work (6) |  |  |
|  | Interprofessional Education course | 1 |
| HSMP 502 | Integrative Experience and Paper | 1 |
| HSMP 509 | Practice Experience | 4 |

Other courses may be approved by the adviser.
Field work (6)
$\begin{array}{lll}\text { HSMP 502 } & \text { Integrative Experience and Paper } & 1 \\ \text { HSMP 509 } & \text { Practice Experience } & 4\end{array}$

## Total Credit Hours: 62

For more information and instructions on how to apply vis it 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 trackstudents 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 assess health disparities, communicate health information, promote health equity, and mobilize resources for social change.

## Program Competencies

Students graduating fromthis 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 changeat multiple levels, including individual, community, organizations, and policy.
- Design and implement strategies to promotehealth.
- Solicit and integrate input from community and organization stakeholders.
- Design and deliver health communication messages.
- Evaluate and interpret results fromprogramevaluations and other research.
- Define research problems, frame research questions, design research procedures, and outline methods of analys is.
- Apply ethical principles that govern the practice of public health.
- Demonstrate cultural competency in health promotion among all social and culturalcommunities.


## REQUIREMENTS

Core Courses ( 17 Credits)
PHE 512 Principles of Health Behavior 3
Epi $512 \quad 4$

ESHH 511 Concepts ofEnvironmental 3
Health
HSMP 574 Health Systems Organization

Bsta 525 Introduction to Biostatistics 4
Health Promotion Required Cours es (34-35Credits)
PHE 511 Foundations of Public Health 3
PHE 517 Community Organizing 3
PHE 519 Introduction to the Etiology of 3
Disease
PHE $520 \quad$ Qualitative Research Design 3
PHE 521 Quantitative Research Design 3
and Analysis
PHE 550 Health Promotion Program 4
HSMP 573 Values and Ethics in Health 3
HSMP 588 ProgramEvaluation and 3
Management In Health Services
PHE 540 Mass Media and Health 3
PHE 541 Media Advocacy and Public 3 Health

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 adv is or will work the student to define and must approvethe Area of Emphas is.
Total Credit Hours: 60-61
For more information and instructions on how to apply vis it the MPH in Health Promotion web page.

## MPH IN PUBLIC HEALTH PRACTICE (ONLINE)

Students in the OHSU-PSU School ofPublic 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 accessibility 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 theoption 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 interprofessionalefforts 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, managementand/or evaluation of population health services.
- Demonstrate basic skills in development of grant proposal.
- Employ techniques to manage human, fiscal, and other public health resource
CORE REQUIRED COURSEWORK (22 CREDITS)

| Bsta 525 | Introductionto 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 <br> course | 1 |
| :--- | :--- | :--- |
| CPH 511 | Research Methods and Evidence- <br> based Practice <br> or | 3 |
| PHE 520 | Qualitative Research Design | 3 |
| CPH 521 | Social Determinants of Health <br> CPH 522 | Communicating Public Health <br> Data |
|  | Da |  |


| CPH 528 | Management Practice and <br> Quality Improvement in Health <br> Care and Public Health | 3 |
| :---: | :--- | ---: |
| CPH 535 | Organizations <br>  <br> Systems Thinking in Public | 3 |
| CPH 536 | Health <br> Community Based Participatory <br> Research | 3 |
| 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 Issues in Public Health <br> Geographic Information Systems | 3 |
| :--- | :--- | :--- |
| CPH 523 | for Public Health <br> Primary Health Care and Health <br> Disparities: GlobalPerspectives <br> and ProgramDevelopment | 3 |
| CPH 526 |  <br> Chronic Disease <br> SocialContext of Public Health | 3 |
| CPH 531 | Policy | 3 |
| HSMP 579 | Health Information Technology <br> and Systems Management | 3 |
| PHE 545 | Men's Health <br> PHE 553 | Women's ReproductiveHealth |
| Total Credit Hours: 56 |  |  |$\quad 4$

## BIOSTATISTICS MS

The Master of Science in Biostatistics degree is designed to provide graduate level training in the application and theory ofbiostatistics. The programis primarily aimed at those wishing to pursue careers as intermediate level biostatisticians or apply for doctoral programs in Biostatistics. The program is also appropriate for individuals who have earned a Graduate Certificate in Biostatistics and wish to pursue further training.

Target audiences for this programinclude individuals who desire careers as collaborativebiostatisticians in the basic, clinical, translational 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 analysis for own research projects or support collaborative research teams
- Translate broad research goals into specifications and procedures forstatistical analysis and interpretation of results in basic, clinical, trans lational and public health research studies
- Select and use appropriate statistical analy sis software for assessment, 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 Cours ework (40 credits)

| Bsta 511 | Estimation and Hypothesis | 4 |
| :--- | :--- | ---: |
|  | Testing for Applied Biostatistics |  |
| Bsta 512 | Linear Models | 4 |
| Bsta 513 | CategoricalData Analysis | 4 |
| Bsta 514 | Statistical Analysis of Time-to- | 3 |
|  | Event Data |  |
| Bsta 517 | Statistical Methods in Clinical | 3 |
|  | Trials |  |
| Bsta 519 | Applied Longitudinal Data | 3 |
|  | Analysis |  |
| 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: | $0 ;$ |
|  | Lab section | Pass |


| Elective Cours ework (14 credits) |  |  |
| :---: | :---: | :---: |
| Bsta 500 | Reading and Research in Biostatistics | 1-3 |
| BMI 550 | Computational Biology I | 4 |
| BMI 551 | Computational Biology II | 4 |
| Bsta 515 | Data Management \& Analysis in SAS | 3 |
| Bsta 516 | Design and Analysis of Surveys | 3 |
| Bsta 521 | Bayesian Methods forData Analysis | 3 |
| Bsta 522 | StatisticalLearning 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 from the 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 rangeofstudents 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 offormaldidactic sessions and hands-on statistical computing. Clas sroomand laboratory training will include ample contextualized examples, and analys is projects using real life data. Opportunities exist for mentored collaborative health science res earch experiences involving ongoing projects with our faculty.

## Core Competencies

Students graduating fromthis programwill be able to:

- Perform a broad rangeofbasic and intermediate level 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
- Conductanalyses for the student's own research projects or provide support to collaborative research teams


## CORE REQUIREMENTS

| Bsta 511 | Estimation and Hypothesis | 4 |
| :--- | :--- | :--- |
|  | Testing for Applied Biostatistics |  |
| Bsta 512 | Linear Models | 4 |
| Bsta 513 | Categorical Data Analysis | 4 |
| Bsta 530 | Biostatistics Lab | 3 |

Subtotal: 15

## ELECTIVE COURSEWORK

| Bsta 514 | Statistical Analysis of Time-to- <br> Event Data | 3 |
| :--- | :--- | ---: |
| Bsta 515 | Data Management\& Analysis in | 3 |
|  | SAS |  |
| Bsta 516 | Design and Analysis of Surveys | 3 |
| Bsta 517 | Statistical Methods in Clinical | 3 |
|  | Trials |  |
| Bsta 519 | Applied Longitudinal Data | 3 |
|  | Analysis |  |
| Bsta 522 | Statistical Learning and Data | 3 |
|  | Science |  |
| Bsta 523 | Design and Analysis of | 3 |
|  | Experimental Designs |  |
| Bsta 524 | Statistical Methods for Next Gen | 3 |
|  | Sequencing |  |
| 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 | $1-3$ |
|  | Biostatistics |  |

Subtotal: 8

## Total Credit Hours: 24

Students in the GraduateCertificate 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 programdesigned 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.

## Program Competencies

Students graduating fromthis programwill be able to:

## -

Use principles of statistical inference forcritical reading and interpretation of reports of statistical analysis and of public health problems;

- Apply epidemiologic methods to identify patterns of diseaseand 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 ofhealth.

For more information and instructions on how to apply vis it the Certificate in Public Health web page.

## Undergraduate Programs

The OHSU-PSU Schoolof 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 interest in the health field.

Undergraduate degrees in the Schoolof 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 \& Fitness degree has 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 and expected 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/no pass) 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 admission to the University. See Admis sions Requirements (p.8) for more information.

## APPLIED HEALTH \& FITNESS B.A./B.S.

## REQUIREMENTS

## Required Cours ework

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 mustalso complete course work in one of three focus areas: Fitness \& Exercise, Fitness for Special Populations, orHealth Coaching.

## Required coursework

| 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 361 | Care and Prevention of Injuries | 4 |


| PHE 363 | Communicable Diseases and | 4 |  |
| :--- | :--- | ---: | :---: |
|  | Chronic Health Problems |  |  |
| PHE 370 | Applied Kines iology | 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: 44-48 |  |  |  |

Subtotal: 44-48

## FITNESS \& EXERCISE FOCUS

| Required Courses |  |  |
| :--- | :--- | :--- |
| PHE 421 | Health Coaching Strategies | 4 |
| PHE 456 | Health Aspects of Aging | 4 |
| PE 128-132 |  | 3 |
| 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 - Motor Learning
PHE 417 - Adapted Physical Education
Psy 311U - Human Development

## FITNESS FOR SPECIAL POPULATIONS FOCUS

| Required Courses |  |  |
| :--- | :--- | :--- |
| PHE 295 | Health Promotion/Disease | 4 |
|  | Prevention |  |
| PHE 340 | Motor Learning | 4 |
| PHE 417 | Adapted Physical Education | 4 |
| PHE 456 | Health Aspects of Aging | 4 |
| PE 101-149 |  | 2 |
| PE 193 | Fitness Instruction: Adapted | 2 |
|  | Physical Education |  |
|  | PHE or approved electives | 8 |

Subtotal: 28

## HEALTH COACHING FOCUS

## Required Cours es

PHE 275 Stress Management

| PHE 295 | Health Promotion/Disease | 4 |
| :--- | :--- | :--- |
|  | Prevention |  |
| PHE 421 | Health Coaching Strategies | 4 |
| PHE 466 | Mind/Body Health: Disease | 4 |
| Comm 218 | Prevention |  |
|  | Interpersonal Communication | 4 |
| PHE or approvedelectives | 8 |  |

Subtotal: 28

## 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 pers pective 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 practice clinical lactation care for families in a variety of settings.


## REQUIREMENTS

| PHE 418 | Lactation Education 1: | 4 |
| :--- | :--- | ---: |
|  | Introduction to Human Lactation |  |
| PHE 419 | Lactation Education 2: Advanced | 4 |
| PHE 420 | Lactation Care |  |
| PHE 409 | Considion Education 3: Clinical <br> Practicum in Lactation | 2 |
|  | 2 | 15 |

Total Credit Hours: 25
For more information aboutthe Human Lactation
Certificate, please vis it: 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 cours ework

| 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 | CooperativeEducation/Intemship | $4-8$ |
| PHE 450 | Epidemiology | 4 |
| PHE 452U | Gender, Race, Class and Health | 4 |
| Stat 243 | Introductionto 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 supportour aging population. Students will build foundations in gerontology while also acquiring skills in adminis tration and finance, prevention of fhronic disease, and health promotion programming, which will positionstudents to enter careers as assisted living or nurs ing home facilities administrators, long-termcare coordinators, health promotion programimplementers, or senior health promotion specialists.
In addition to the previously listed common core requirements, students pursuing a concentration in aging services must complete the following:

| Required cours ework (28 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 and Evaluation | 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 ofAging | 4 |
| Choose one of the following: |  |  |
| BA 306U | Essentials of Finance for NonBusiness Majors | 4 |
| BA 316U | Essentials of Marketing forNonBusiness 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 |  |$\quad 4$


| PHE 443U | Environmental Health |
| :---: | :---: |
| PHE 444U | Global Health |
| PHE 472 | Marketing Public Health |
| PHE 478 | ProgramPlanning and Evaluation:Needs Assessment and Interventions |
| PHE 479 | ProgramPlanning and Evaluation in Health Education: Implementation and Evaluation |
| Twenty (20) | edits from the following courses: |
| PHE 275 | Stress Management |
| PHE 325U | Nutrition for Health |
| PHE 326U | Drug Education |
| PHE 335U | Human Sexuality |
| PHE 351U | Film and Health |
| PHE 355U | Consumer Health Issues |
| PHE 361 | Care and Prevention of Injuries |
| PHE 365 | Health Promotion Programs for Children and Youth |
| PHE 445 | Men's Health |
| PHE 446U | Community Health Principles and Practices |
| PHE 448 | Health Education Techniques and Strategies |
| PHE 451 | Women and Holis tic Health |
| PHE 453 | Women's ReproductiveHealth |
| PHE 456 | Health Aspects of Aging |
| PHE 466 | Mind/Body Health:Disease Prevention |
| PHE 467 | Mind/Body Health: Human Potential |
| PHE 480 | Controversial Issues in |
|  | Community Health |
| PHE 320U | Health Ethics: Contemporary |

Otherelectives may be taken with advisor approval.

## HEALTH SERVICES ADMINISTRATION CONCENTRATION

The health services adminis tration concentration is designed for individuals who wish to develop or enhancea 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 ofhealth systems with particular knowledge and skills in administration and finance, health policy, and health systems.
The programofstudy includes common core requirements, required courses, and elective courseoptions. Students pursuing a concentration in health services adminis tration must complete the following:

| Required Cours es (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 | Special Studies | 1-4 |
| PHE 354U | Social Gerontology | 4 |
| PHE 423 | Business and Aging | 4 |
| PHE 472 | Marketing Public Health | 4 |

Otherelectives 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, nurs ing, physical therapy, occupational therapy, pharmacy, dentistry, dental hygienics, ophthalmology, and others.

In addition to the previously listedcommon core requirements, students purs uing 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 ass is tant and pre-physician assistantor adviser approved
option. In choosing courses to complete, students should verify the specific prerequisites required by the professional school(s) to which an application for admission is being submitted. Advising sheets summarizing prerequisites for professional schools in Oregon and selected schools in the Pacific Northwest can be found online at $\mathrm{http}: / / w w w . p d x . e d u /$ clas/prepro.html.
Students must complete all prerequisites required by the professional school to which an application is being submitted to receive a Health Science degree. Please cons ult regularly with your pre-health advis er.

In addition to the previously listed core courses, students must also complete 16 credits from the following upperdivision courses:
16 credits from the following upper-division courses:

| PHE 325U | Nutrition forHealth | 4 |
| :--- | :--- | ---: |
| PHE 351U | Film and Health | 4 |
| PHE 354U | SocialGerontology | 4 |
| PHE 355U | ConsumerHealth Is sues | 4 |
| PHE 361 | Care and Prevention of Injuries | 4 |
| PHE 365 | Health Promotion Programs for | 4 |
|  | Children and Youth | 4 |
| PHE 370 | Applied Kinesiology | $1-8$ |
| PHE 410 | Selected Topics | 4 |
| PHE 444U | Global Health | 4 |
| PHE 445 | Men's Health | 4 |
| PHE 446U | Community Health Principles | 4 |
|  | and Practices | 4 |
| PHE 451 | Women and Holistic Health | 4 |
| PHE 453 | Women's ReproductiveHealth | 4 |
| PHE 456 | Health Aspects ofAging | 4 |
| PHE 466 | Mind/Body Health: Disease | 4 |
| PHE 467 | Prevention | Mind/Body Health: Human |
|  | Potential | 4 |
| PHE 473 | Physiology ofExercise | 4 |
| PHE 474 | Exercise Prescription and | 4 |
| PHE 475 | Training | Exercise Testing Techniques |

Otherelectives may be taken with advisor approval.

## SCHOOL HEALTH EDUCATOR CONCENTRATION

The SchoolHealth 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 oftopics fromsafety 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 School of Education at PSU.

In addition to the previously listed common core requirements, students pursuing a concentration in school health education must complete the following:

| Required coursework (36 credits) |  |  |
| :--- | :--- | :--- |
| PHE 275 | Stress Management | 4 |
| PHE 295 | Health Promotion/Disease | 4 |
|  | 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 Education Techniques and | 4 |
|  | Strategies |  |
| Psy 311U | Human Development | 4 |
| Ed 420 | Introductionto Education and | 4 |
|  | Society |  |

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 Classroom | 3 |
| Psy 346 | Learning | 4 |
| Soc 337U | Prejudice, Privilege, and Power | 4 |
| SpEd 418 | Survey of Exceptional Learners | 3 |
|  | PHE Elective Classes as approved byadvisor |  |
|  | Women's Studies courses on |  |
|  | Violence and Sexuality |  |

## AGING SERVICES MINOR

The minor in aging services includes cours ework that will introduce the student to basic understanding of gerontology along with particularskills in adminis tration and finance, chronic disease, and health promotion. This programalso will enhance the skills of students planning to enroll in industry-provided training to become adminis trators 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 betaken in residence at PSU and 16 credits must be upper division. The requirements for this minor include:

| PHE 354U | Social Gerontology | 4 |
| :--- | :--- | :--- |
| PHE 456 | Health Aspects of Aging | 4 |

PHE 456 Health Aspects of Aging

Two of the following:

| PHE 328U | Health and Housing Across the Life Course | 4 |
| :---: | :---: | :---: |
| PHE 416 | Families and Aging |  |
| PHE 423 | Business and Aging | 4 |
| 12 Credits from the following courses: |  |  |
| PHE 250 | Our Community: Our Health |  |
| PHE 295 | Health Promotion/Disease |  |
|  | Prevention |  |
| PHE 325U | Nutrition for Health |  |
| PHE 328U | Health and Housing Across the Life Course |  |
| PHE 350 | Health and Health Systems |  |
| PHE 363 | Communicable Dis eas es and Chronic Health Problems | 4 |
| PHE 369 | Public Health Law, Policy, and Ethics | 4 |
| PHE 370 | Applied Kines iology |  |
| PHE 416 | Families and Aging |  |
| PHE 444U | Global Health |  |
| PHE 445 | Men's Health |  |
| PHE 446U | Community Health Principles and Practices |  |
| PHE 450 | Epidemiology |  |
| PHE 451 | Women and Holistic Health |  |
| PHE 473 | Phys iology of Exercise |  |
| PHE 320U | Health Ethics: Contemporary Issues |  |
| Other electives may be taken with advisor 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
PHE 452U Gender, Race, Class and Health PHE or approvedelectives

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 applying 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 passed 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 Health 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 our health 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 established at Portland State University in 1961 by a resolution of the Oregon 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 toward preparing effective and creative graduates who are ethical and culturally responsive. Students learn to serve individuals and families directly, evaluate practice, develop and adminis ter programs, organize neighborhoods and communities, analyze social policies, conduct research, and initiate necessary reforms ofexisting 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, Youth, andFamily Studies (CYFS) program; the Baccalaureate Social Work (B.S.W.) program; the Master ofSocial Work (M.S.W.) program; the DistanceM.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 for students who have varied professional goals related to working with children, youth, and their families. Students who are interested in becoming elementary schoolteachers, 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 cas eworkers, programdirectors/adminis trators, and classroomassistants. Students gain an interdisciplinary perspective 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 developmentand 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 childhood education, 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. Admittancerequirements are the completion of 90 credits, Ed 420, and Psy 311 U or Psy 460 or their equivalents. Once thes eprerequisites have been met, students submit their intention to pursue the major and are formally admitted. Information meetings are held for students who are cons idering admission into the program. Call 503-7258241 or vis it https://www.pdx.edu/social-work/information-sessions to schedule attendance at an informationalmeeting. Further information and admis sions forms can be obtained by visiting:
https://www.pdx.edu/social-work/cyfs-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 programcomponents:

| Required Cours es |  |  |
| :---: | :---: | :---: |
| CFS 310 | Critical Histories in CYFS: Gender/Race/Class | 4 |
| CFS 312U | Families in Lifecourse Perspective | 4 |
| 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 | ActivismforSocialChange | 2 |
| CFS 492 | Family Law and Policy | 4 |
| CFS 493 | Professional Self: Ways of Knowing | 2 |
| CFS 494 | Professional Self: Critical Thinking | 2 |
| CFS 495 | Professional 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 or | 4 |
| Soc 461 | Sociology of the Family | 4 |
| SpEd 417 | Introduction to Special Education or | 4 |
| 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 320U | ABCs of Early Childhood Education | 4 |


| CFS 330U | American Families in Film and <br> Televis ion | 4 |
| :--- | :--- | ---: |
| CFS 340U | Queer Families |  |
| CFS 350U | Interpersonal Violence: Impact <br> on Children \& Families <br> MentalDisorders:Issues for <br> CFS 382U | 4 |
|  | Families and Communities | 4 |
| CFS 385U | Working with Diverse Families | 4 |
| CFS 386U | Youth Healthy Relationships and | 4 |
| CFS 390U | Sexuality Education |  |
| CFS 393U | Sex and the Family | 4 |
| Community Res ources and | 4 |  |
| CFS 399 410 | Family Support | 4 |
| CFS 410 | Special Studies | $1-4$ |
| CFS 450 | Child Life | $1-8$ |
| CFS 486 | Youth and Youth Work | 4 |
| Subtotal:76 | Parent and Family Education | 4 |
|  |  | 4 |

Subtotal: 76
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/no pass) 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 Inquiry | 4 |
| Community-bas ed learning (6 credits) |  |  |
|  | Arranged in consultation with adviser; may be Capstone or Practicum | 6 |
| Choose four of the following CYFS courses (16 credits) |  |  |
| CFS 101 | Introduction to Child and Family Studies | 2 |
| CFS 310 | Critical Histories in CYFS: Gender/Race/Class | 4 |
| CFS 312U | Families in Lifecourse Perspective | 4 |
| CFS 320U | ABCs of Early Childhood Education | 4 |
| CFS 330U | American Families in Film and Television | 4 |
| CFS 340U | Queer Families | 4 |
| CFS 350U | Interpersonal Violence: Impact on Children \& Families | 4 |
| CFS 381U | Families, Stress, and Change | 4 |


| CFS 382U | Mental Disorders: Issues for <br> Families and Communities | 4 |
| :--- | :--- | ---: |
| CFS 385U | Working with Diverse Families | 4 |
| CFS 386U | Youth Healthy Relationships and <br> Sexuality Education | 4 |
| CFS 390U | Sex and the Family | 4 |
| CFS 391 | Family Theories | 4 |
| CFS 393U | Community Resources and | 4 |
|  | Family Support | 4 |
| CFS 399 | Special Studies |  |
| CFS 410 | Selected Topics | $1-4$ |
| CFS 450 | Youth and Youth Work | $1-8$ |
| CFS 486 | Parent and Family Education | 4 |
| CFS 487 | Examining Bias and Belief | 4 |
| CFS 488 | StructuralOppression | 4 |
| CFS 489 | Activismfor SocialChange | 4 |
| CFS 492 | Family Law and Policy | 2 |

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 W ork Education. Two graduate degree programs are offered by the School of Social Work: a Master of Social W ork(M.S.W.) degree, which is fully accredited by the Council on Social Work Education, and a Ph.D. degree in Social Work and SocialResearch.

## 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 W ork (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 W ork, 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 development. Applicants are also advised to take SW 301 Introduction to Social W ork, sinceth is course is designed, in part, to assist interested students in selecting social work as a profession. If applicants have not completed this requirement prior to admission, they must take it once they are enrolled in the major.
The application packet must include an application form, answers 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 admission. 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 must be submitted by the appropriate deadlines for consideration for admission in Summer or Fall terms. Early submission 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. programof the School of Social Work 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 naturalsciences, 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 ofbachelor of social work (B.S.W.) programs accredited by the Council on Social Work Education may apply for advanced standing. Students who have completed up to one year of study toward the M.S.W. degree at another graduate school of social work accredited by the Councilon Social Work Education may apply for admission and transfer of credits.
Students admitted to the master's programare required to be in continuous enrollment unless an approved leave of absence has been granted. A student who withdraws from the School must reapply.

For the M.S.W.-M.P.H. dual degree, students must submit separate applications to each program(the School of Social W ork and either the School of Community Health or the Mark O. Hatfield School of Government, depending on the focus ofstudy) 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 admissions 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 Philos ophy in Social Work and Social Research

Applicants for admis sion must have a master's degree in social work or a related field. Applicants must have writing ability and the capacity for creative and independentwork. 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 admis sion 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 whommust be academic;
- a personal statement; and
- a resume

Students whosenative language is not English should include the scores of the TOEFL, IELTS orPTE-A cademic 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 consecutiveterms 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. 54).

SOCIAL WORK B.A./B.S.

The Baccalaureate Social Work (BSW) Programis fully accredited by theCouncil 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-on experience which prepares undergraduate students for careers in social work and related fields and for future graduate studies. Students in our BSW 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" of learners. The cohort model provides a place for peer support, sharing of ideas, and resources. Students also haveBSW advis ors to support their academic and other educational needs. The curriculum prepares 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 arts 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 social environment, 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 from the BSW Programare prepared to become active social justice change agents ready to provide professional generalistsocial work practice in the community.

## REQUIREMENTS

In addition to meeting the general University requirements for a Bachelor of Arts orBachelorofScience degree, majors must complete the following programcomponents:

## 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.


## Upper Division ProgramElectives (12 credits)

Choose froma list; see advisor.
Subtotal: 75

## SOCIAL WORK M.S.W.

The Master of Social Work (M.S.W.) programat Portland State University is fully accredited by the Council on Social Work Education (CSWE).

## MSW ProgramMission

The miss ion of the Portland State University MSW programis to educate students for advanced leadership and practice that recognizes and dismantles systems of oppression; builds racialequity and social, political, and economic justice; and advances thewell-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 res is tive to colonial, heteropatriarchal, classist, and white supremacist agendas.

MSW ProgramGoals:
The MSW Programmission is realized by providing a statewide program that 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 andethics

## -

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 and economic class, sex, gender identity, sexual orientation, marital status, 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 to improve practice and advance social and economic justice
-
Use practice experience, empiricalevidence, 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 justice after graduation.

The master's programoffers students five courses of tudy: (1) a traditional full-time two-yearcourse option; (2) a part-time three-or four-year option in Portland; (3) an advanced standing one-year option in Portland, Eugene, Central Oregon, and Online; (4) a part-time three-year distance options in Eugene and CentralOregon; and (5)a part-time three-yearonline option.

The curriculumcombines concurrenton-campus cours ework and field work in a range of human service organizations. Typical practice settings are mental health programs, public welfare and human serviceagencies, 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. Students in the Portland option have the choice of four concentration areas: Health Across the Lifespan; Children, Youth, and Families; Clinical Social Work Practice; and Practice and Leadership with Communities and Organizations. The electives provide opportunities for students to have a deeper learning experience with a specific population, problemor intervention.

The M.S.W. Distance Option (DO) programoffers an advanced concentration in Clinical Social Work. In fall 2021, a new cohort of students will begin in Eugene and Central Oregon, and thosesites will also each have a cohort in their final year. The Salem and Southern Oregon cohorts will begin their second year. While the first year of distance learning is course work only, second year and third year students have 16 hour per week field internships in or near their home communities. The Southern Oregon and Central Oregon programs offer all classes on site or online. First year classes in Eugene are held on the PSU campus in Portland, and second and third year classes occur on site or online. The Eugene sitewill recruit new students for fall 2022.

The M.S.W. Online programoffers two advanced concentrations: Practice and Leadership with Communities and Organizations and Health Across the Lifespan. Course instruction is exclusively online using as ynchronous and synchronous delivery methods, though students will be expected to come to campus for a two-day 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 and third year students have 16 hour per week field internships in or near their home communities, in addition to taking their courses.

Students admitted to the Advanced Standing option havea BSW from a CSWE accredited school of social work, and complete the advanced year of the curriculum over 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-s ocialwork.

## REQUIREMENTS

The M.S.W. is a 78 credit programcomprised of foundation and advanced coursework. Subtotal: 78

## FOUNDATION COURSEWORK

The foundation coursework can be satisfied in one oftwo 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 thesummer at PSU.
SW 513 Research Methods forSocia
Work Advanced Standing
Students
SW 589 Advanced Standing Seminar
Option 2
Completion of a 39 credit graduate foundation course sequence at PSU, which includes the following courses:
SW 511 Field Seminar and Field 1-4 Placement
SW 515 Skills for the Helping Process - 3 Groups
SW 520 Social Welfare History and 3
Policy
SW 530 Social Work Practice with

Individuals and Families I
Theory and Engagement

| SW 531 | SW Practice with Individuals and <br> Families II Theory, Assessment <br> and Intervention | 3 |
| :--- | :--- | ---: |
| SW 532 | Advocacy and Empowerment | 3 |
| SW 539 | SocialJustice in Social Work | 3 |
| SW 541 | Societal, Community and <br>  <br>  <br> Organizational Structures and | 3 |
| SW 550 | Processes |  |
| SW 551 | Research andEvaluaton I |  |
| Research andEvaluation II | 3 |  |

SW 539

## ADVANCED COURSEWORK

The advanced coursework involves an additional 39 credits of advanced graduate courses.
Advanced Concentrations
9 credits ( 3 credits per term) in one of the advanced concentrations:
Clinical Social Work Practice

| SW 533 | Clinical Social Work Practice I | 3 |
| :--- | :--- | :--- |
| SW 534 | Clinical Social Work Practice II | 3 |
| SW 535 | Clinical Social Work Practice III | 3 |

## Practice and Leadership with Communities and Organizations

SW 593 Practice and Leadership with
Communities and Organizations I
SW $594 \quad$ Practice and Leadership with Communities and Organizations II
SW 595
Practice and Leadership with
Communities and Organizations III

Social Work with Children, Youth, and Families
SW 586 Children, Youth and Families I 3
SW 587 Children, Youth, and Families II 3
SW 588 Children, youth, and families III
Health Across the Lifespan
SW $517 \quad$ Health Across the Lifespan I
SW 518 Health Across the Lifespan II
SW 519 Health Across the Lifespan III

## Advanced Field Placement

12 credits SW 512 Advanced field placement (4 credits each of three terms)
SW 512 Advanced Field Placement 1-4

## Electives

18 credits of advanced electives 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 W ork and Social Research to educate the next generation of scholars, res earchers, teachers and leaders in social work and related fields. The programprepares students to contribute to scholarly knowledge, conductethical, rigorous, and community-engaged research, and teach passionately and effectively in various settings--all with special attention to equity andjustice. The Regional Research Institute for Human Services and the Center for the Improvement of Child and Family Services are major resources for the program.

Coursework 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 student must 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 res ponses to social is sues; quantitative and qualitativeresearch 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
SW 622
SW
Substantive Area Investigation
626/PHE
626
SW 630

Teaching and Learning in Health
Promotion \& Social W ork
Philosophy of Science for Social
3

| SW 637/Psy | Qualitative Research Methods | 4 |
| :--- | :--- | :--- |
| 637 | for Social Inquiry |  |
| SW 640 | Research Practicumand Seminar | 3 |
| SW 650 | History ofSocial Work | 3 |
|  | Profession/al |  |
| SW 660 | 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 (16 credits)

Appropriate interdisciplinary
socialscienceresearch methods courses
Other Electives (16)
Appropriate courses in student's 16 substantive area of focus

## Diss ertation ( 27 credits)

Subtotal: 90

## Compre hensive examination

A written comprehensiveexamination is taken after completion of required coursework.

## Dis sertation

After successful completion of the comprehensive examinations, the dissertation 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 UniversityHuman 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 dis sertation research.

## Final examination

At the conclusion of doctoral work, the student defends the completed dissertation before the dis sertation committee and other interested faculty and doctoral students. The student is expected to demonstrate knowledgeof 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)

## 1600 SW 4th Ave., 4th floor

503-725-5022
Katharine Cahn, Executive Director

Our vision is that all children, youth, and families are safe, connected, and thriving, supported by effective and equitable organizations, institutions, and community systems. We build the capacity ofhuman 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 changethrough 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, res earch 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 staffusing state of the art adult education approaches (including a simulation lab). Allofferings are evaluated for quality assuranceand measurement of impact. The Child Welfare Partnership's Education Program(CWEP) provides financial support and customized professionaleducation for bachelor and master's level social work students committed to careers in child welfare and includes an evaluation of program impact. This programincludes the Culturally 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 System of 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 System of Care, improvement of child-serving systems, and sustainable workforce development.
The Center's Early Childhood andFamily 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 established in 1972 by the School of Social Work at Portland State University with a grant from the Social and Rehabilitation Service within the office of Health, Education, and Welfare (HEW). The aim ofthe 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-site 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 research 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 Centeron Family Supportand Children's Mental Health was initiated, the RRI has been a leader in the field of mental health research and education. The RRI also 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 foryoung people with drug and alcohol problems, and its model for systemchangehas been implemented in jurisdictions around the country.
For more 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-our students and faculty fuse theory and practice into solutions for the common good. Our students and faculty collaborate with community organizations, imagine original solutions, and implement them in real-time. Upon graduation, our students are equipped to improve the livability of their communities.
In a state where land-use planning, transportation, environmental aspects 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 largest public policy schools in the country. It includes the departments of Criminology and Criminal Justice, Political Science, and Public Administration. Our nationally-ranked programs in public administration, nonprofit management, political science, and criminology \& criminal justice 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, and criminal justice.

## Nohad A. Toulan School of Urban Studies and Planning

The Toulan School ofUrban 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 mission 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 profes sional 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 departmentoffers a wide range of courses and a variety of academic degrees, including bachelor's degrees, a masters degree, and a fourcourse Graduate Certificate in Environmental and Natural Resource Economics. The department also sponsors yearround seminars for students that address crucial policyoriented and theoretical topics.

## Department of International and Global Studies

The Department of International and Global Studies endeavors to foster a deep understanding of global issues, 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 InternationalDevelopment Studies, and two with regional specialization, in As ian 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 are important. Our students have also secured admission to top interd is ciplinary 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-dis ciplinary opportunities, internships, and rigorous curricula. Graduate students enter a world of profes sional academic scholarship and analysis, preparing themfor doctoratelevelstudy 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 is sues in the public sector, nonprofit sphere, health care administration, and beyond. Our faculty and community of instructors offer decades of wisdomgleaned fromboth studying and applying theory. This wisdomis continuously being practiced and refined, as faculty members and instructors remain actively engaged in scholarship, service, and practice. OurDepartment 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 Systems
- Graduate Certificate in Transportation
- Graduate Certificate in Urban Design


## Undergraduate Certificates

- Advanced Crime Analysis Certificate
- Criminal Behavior Certificate
- Leadership in Criminal Justice Certificate
- 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 Turkish Studies Certificate (not accepting new admis sion to the certificate)
- Campaigning to Win a U.S. Political Campaign
- Women's Leadership

Non-Credit Certificates

- Professional Certificate in Nonprofit Fundrais ing
- Professional Certificate in Nonprofit Program Evaluation
- Certificate in Tribal Relations


## Minors

- Minor in Civic Leadership
- Minorin 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
- Minor in International Economics
- Minor in Political Economy


## 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: A frica (not accepting new admission to this concentration)
- B.A.-International \& Global Studies- Asia
- B.A.-International \& GlobalStudies-Europe (not accepting new admission to this concentration)
- B.A.-International \& GlobalStudies-Latin America
- B.A.-International \& GlobalStudies-Middle East (not accepting new admis sion to this concentration)
- B.A.-International \& GlobalStudies-International DevelopmentStudies
- B.A.-International \& GlobalStudies-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 Management and Community Resilience
- E.M.P.A.-Executive Master of Public Administration
- M.P.A.-Nonprofit Management
- M.P.A.-Natural ResourcePolicy and Administration
- M.P.A.-LocalGovernment
- M.P.A.-Global Leadership and Management
- M.P.A.-Human Resource Management
- M.P.A.-HealthManagement and Policy
- M.P.A.-Health Administration
- M.P.P.-Master of Public Policy
- M.R.E.D.-Master ofRealEstate 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 organizations whose jobs include responsibility for planning and organizing response
to dis asters, both natural and human made. The curriculum of this graduate program is designed at the intersections of scientific research, applied public policy, and effective crisis leadership - as well as at the crossroads of multiple disciplines and approaches to dis aster and resilience. This transdisciplinary approach to understanding emergency management and community resilience offers a rich intellectual and applied basis forgraduate study.

## CORE COURSE REQUIREMENTS

Each student must enroll in and successfully completenine 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 |  |
| EMCR | Principles and Practices of | 3 |
| 587/PA 587 | Emergency Management |  |
| EMCR | Risk and Strategic | 4 |
| 545/Comm | Communication |  |
| 545 |  |  |
| EMCR 550 | International Perspectives on | 3 |
|  | Dis aster Management \& |  |
|  | Resilience |  |
| EMCR | Culture, Vulnerability and | 4 |
| $\begin{aligned} & \text { 591/Anth } \\ & 591 \end{aligned}$ | Disaster Resilience |  |
| EMCR 595 | Capstone Seminar in Emergency | 4 |
|  | Management and Resilience |  |
| EMCR | Climate Resiliency Planning | 3 |
| 560/USP |  |  |
| 560 |  |  |
|  | or |  |
| EMCR | Community Resilience in | 4 |
| 567/Geog | Coupled Socio-Ecological |  |
| 567 | Systems |  |
| SKILLS AND M ETHODS REQUIREM ENTS |  |  |
| Students must take a minimum of three courses (9 credits), with a minimum ofone in each of the two Skills and Method Areas: |  |  |
|  |  |  |
| 1. |  |  |
| Research Design, Evaluation, Communication, and |  |  |
| 2. |  |  |
| Qualitative an | Quantitative Methods |  |

These courses focus on skills and methodologies that support varied careers with in the emergency management profession. A list of approvedelectives is available from the ProgramDirector.

## FIELD SPECIALIZATION REQUIREMENTS

Students in this programmust take a minimum of four courses ( 12 credits) within oneof the four Field 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 Disasters | 4 |
| :---: | :---: | :---: |
| EMCR | Building Community Resilience | 4 |
| 530/USP |  |  |
| 530 |  |  |
| EMCR | Culture, Vulnerability and | 4 |
| 591/Anth | Disaster Resilience |  |
| 591 |  |  |
| ONE OF THE FOLLOWING: |  |  |
| EMCR | Risk and Strategic | 4 |
| 545/Comm | Communication |  |
| 545 |  |  |
| EMCR 550 | International Perspectives on | 3 |
|  | Disaster Management \& |  |
|  | Resilience |  |
| EMCR | Climate Resiliency Planning | 3 |
| 560/USP |  |  |
| 560 |  |  |
| EMCR | Community Resilience in | 4 |
| 567/Geog | Coupled Socio-Ecological |  |
| 567 | Systems |  |

ONE OF THE FOLLOWING:

| EMCR | Strategies for Organizing | 3 |
| :--- | :--- | :--- |
| 535/PA 535 | Recovery, Mitigation and |  |
|  | Resilience |  |
| EMCR | Principles and Practices of | 3 |
| 587/PA 587 | Emergency Management |  |

Total Credit Hours: 18-19

## Undergraduate programs

## 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.

## DEGREE REQUIREMENTS

## Requirements for majors

In addition to the general University degree requirements, students in urban and public affairs must complete the following degree requirements. Substitution of coursework is acceptable only by permission from the School.

## URBAN AND PUBLIC AFFAIRS B.A./B.S.

## PROGRAM REQUIREMENTS

## Internship/fieldexperience (4 credits)

Choose an approved course from any participating academic unit to complete in senior 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 analysis course fromany of the participating academic units.
CCJ $340 \quad 4$

CCJ $380 \quad 4$
PHE 450 Epidemiology 4
PS 495 Topics in Specialized Research 4
Stat 243 Introduction to Probability and 4
USP 430 Participatory Research Methods 4
for Community Development
Measuring People and
USP 440 Measuring People and

USP 452

## GIS for Community Development

## Elective cours es ( 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 cours es ( $\mathbf{2 4}$ credits)

Students must complete 6 courses representing at least 3 of the 7 academic disciplines listed below:
CCJ $200 \quad \begin{aligned} & \text { Criminology and Criminal } \\ & \\ & \text { Justice }\end{aligned}$

CCJ $230 \quad$| Policing in America |
| :--- |
| or |

CCJ 240 PunishmentandCorrections
CCJ 330U Crime ControlStrategies 4

PA 311U | Introductionto Civic |
| :--- | :--- |
| Engagement |

PA 312U Foundations ofCommunity 4
PA 313U Fundamentals of Public Service 4
PS 101 United States Government 4
PS 102 United States Politics 4
PS 204 Comparative Politics 4
PS 205 International Politics 4
PS 431 State and Local Politics 4
USP 300U Introduction to Urban Studies 4
USP 301U Introduction to Community 4
USP 311U Introduction to Urban Planning 4
PHE $350 \quad$ Health and Health Systems 4
PHE 446U Community Health Principles 4
and Practices
PHE 250 Our Community: OurHealth
4
Ec 201 Principles of Microeconomics 4
Ec 202 Principles of Macroeconomics
Ec 332U Economics of Environmental Issues
Intl201 Introductionto International
Intl 296 The United States and the World
Intl 397
Theory and Policy in International Development

## 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 them for lifelong professional success, (2) conducting and dis seminating research on theoretical and policy-relevant topics, and (3) collaborating with justice-related organizations to as sess, evaluate, and improve policy and practice. Our Department values empirical inquiry, access to higher education, diversity, social justice, and community engagement.

## Undergraduate Program

The Department ofCriminology \& Criminal Justice offers both a campus-based and fully online pathway toward its bachelor degree. The undergraduate programseeks to educatestudents aboutthe 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 demonstrated 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 gone on to pursue advanced degrees in such areas as law, criminal justice, psychology, social work, 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

Admission to the department is based on general admission to the University. See Admissions Requirements (p. 8) for more information.
There is an auxiliary application for the fully online program. For more details, please
visit www.pdx.edu/criminology-criminal-justice.
CRIMINOLOGY AND CRIMINAL JUSTICE, B.A./B.S.

## REQUIREMENTS

In addition to meeting the general university degree requirements, students who major in Criminology \& Criminal Justice (CCJ) must complete core and elective courses within the department. Some of these courses require senior status, and students should read course descriptions in the currentPSU Bulletin before registration. All core and elective courses submitted to satis fy the requirements for the major, whether taken at PSU or elsewhere, mustbe 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 department major requirements. The CCJ degree requirements are:

## Core Courses

Transfer equivalent courses may hold a different credit value than the ones listedhere.

| CCJ 200 | Criminology and Criminal | 4 |
| :--- | :--- | :--- |
|  | Justice |  |
| CCJ 230 | Policing in America | 4 |
| CCJ 240 | Punishment and Corrections | 4 |
| CCJ 310 | American Courts | 4 |
| 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 | CooperativeEducation/Internship | 8 |
| :--- | :--- | :--- |
| CCJ 420 | Criminal Law and Legal | 4 |
|  | Reasoning |  |

Subtotal: 41-44

## CCJ Electives

Students take 8 credits of courses fromthe 100-400 level range. An additional 16 credits must be taken at the 300400 level range, totaling 24 credits.

Subtotal: 24
Subtotal: 65-68

## CRIMINOLOGY AND CRIMINAL JUSTICE 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 elsewhere, must be passed with a grade ofC ( 2.00 GPA ) or above. A course grade ofCdoes not s atisfy this requirement. Courses takenunder 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
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 thelow

CCJ 230 Policing in America 4
CCJ 240 Punishmentand Corrections 4
CCJ 310 American Courts 4
Subtotal: 32

## CRIMINOLOGY AND CRIMINAL JUSTICE POST-BACCALAUREATE CERTIFICATE

To earn a post-baccalaureate certificate 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 regis tration. All core and elective courses submitted to satis fy the requirements for a post-baccalaureate certificate, whether taken at PSU or elsewhere, must be passed with a grade of "C" ( 2.00 GPA ) or above. A course grade ofC- 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 Justice | 4 |
| 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 of 8 credits at or above 300level) | 12 |
| Two courses fromlist below |  |  |
| CCJ 230 | Policing in America | 4 |
| CCJ 240 | Punishment and Corrections | 4 |
| CCJ 310 | American Courts | 4 |
| Subtotal: 40 |  |  |

Total Credit Hours: 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/admissions/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 univers ities 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 programofstudy designed to provide students a broad-basedunderstanding of the criminal justice system and society's response to crime. A major goal of the programis to develop understanding of the applied and theoretical as pects 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 classes, 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 involved in a community based on collegial and collaborative relationships evidenced by co-learning and critical dialogue in the classroom and student-faculty partnerships outsideof the classroomon writing, research, and community engagement projects.
2. Initiative and Original Thinking: 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 evidenceof their professional growth related to theory, research, policy, communication, justice, diversity, and community engagement.

## DEGREE REQUIREMENTS

All candidates for a master's degreemust complete a minimum of 51 graduate credits distributed as follows:

1. 24 cred it 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. Successfulsubmission anddefenseofa portfolio, field project or thes is.

| Substantive Core |  |  |
| :--- | :--- | :--- |
| CCJ 512 | Institutions ofthe Criminal <br> Justice System | 3 |
| CCJ 513 | Professional Orientation in <br> Criminology and Criminal | 3 |
|  | Justice |  |
| CCJ 515 | Theories of Crime and Justice | 3 |
| CCJ 520 | Analysis of Crime and Justice | 3 |
| CCJ 521 | Data <br> Advanced Regression in | 3 |
| CCJ 525 | Criminology \& Criminal Justice |  |
| CCJ 530 | Criminal Justice Theory <br> CCJ 535 | Criminal Justice Research |
| Crimalice Policy |  |  |

## 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 administration, computer science, political science, sociology, or geography.
Courses may be selected fromseveral academic units so long as they comprise a coherent field ofstudy 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 ofCriminology and Criminal Justice.

## Portfolio, Field Project, or Thesis

Candidates mustcomplete oneof 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.

- Thesis: 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 proceeding with the thes is option. To satis fy thesis requirements, students must pose an empirical res earch 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, orother product that directly benefits an externalagency. The field project must have a strong applied focus and address a specific professional or organizational 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 QuantitativeEconomics
- DepartmentalHonors
- Minor in Economics
- Minor in International Economics
- 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 Analysis


## 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-Social Science
- M.S.T. and M.A.T. (General Social Science)


## Undergraduate programs

Economics majors are advised to contact the department undergraduate advisor for assistance with planning an individualized programofstudy. Economics majors who are cons idering graduate school will need to tailor their undergraduate program for 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

Admission to the department is based on general admission 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 <br> or | 4 |
| :--- | :--- | :--- |
| Ec 415 | Microeconomic Theory with | 4 |
| Ec 312 | Calculus <br> Macroeconomic Theory | 4 |4


| One of the following |  |  |
| :--- | :--- | :--- |
| Ec 456 | American Economic History: the | 4 |
| Ec 457 | First Century <br> American Economic History: the | 4 |
| Ec 460 | 20th Century |  |
| Ec 469 | History of Economic Thought | 4 |
| Introduction to Econometrics |  |  |

Subtotal: 4

## Economics Electives ( $\mathbf{2 8}$ credits)

Up to 12 credits may be below EC 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 | 4 |
|  | Statistics I |  |
| Stat 244 | Introduction to Probability and <br>  Statistics II | 4 |

Subtotal: 12
Majors must take a minimum of 24 credits of upper division ( 300 and above) coursework in residence from this department and mustmaintain 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 must be graded C-or above. Ec 403 Honors Thesis cannot be used to satis fy the requirements for the major in economics. Up to 4 credits ofEc 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 of79 credit hours, 28 for core courses, 28 for economics electives, and 23 formath/statistics courses. The curriculumis designed to preparestudents forentry 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 another field.

| Economics Core |  |  |
| :---: | :---: | :---: |
| Ec 201 | Principles of Microeconomics | 4 |
| Ec 202 | Principles of Macroeconomics | 4 |
| Ec 415 | Microeconomic Theory with Calculus | 4 |
| Ec 312 | Macroeconomic Theory | 4 |
| Ec 380 | Introduction to Mathematical Economics | 4 |
| Ec 460 | History of Economic Thought | 4 |
| Ec 469 | Introduction to 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 Eng ineers and Scientists I | 4 |
| Stat 452 | Applied Statistics for Engineers 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 ofEc 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 residence from this 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, whether economics, mathematics or statistics, must be taken for a lettergrade and must be gradedC- 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 upperdivision credit in the major.
Total CreditHours: 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 cours es 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 completeMth 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 satis fy the requirements for the $\mathrm{BA} / \mathrm{BS}$ in economics.
- A written thes is 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 residenceat PSU), to include the following:

## Courses ( $\mathbf{1 6}$ credits)

| Ec 201 | Principles ofMicroeconomics | 4 |
| :--- | :--- | :--- |
| Ec 202 | Principles of Macroeconomics | 4 |
| Ec 340 | International Economics | 4 |
| Ec 350U | Economics ofDeveloping | 4 |
|  | Countries |  |

Subtotal: 16

| Upper-division economics electives chosen from: (12 <br> credits) <br> Ec 440 | International Trade Theory and | 4 |
| :---: | :--- | :---: |
| Ec 441 | Policy |  |
|  | International Monetary Theory <br> and Policy | 4 |
| Ec 442 | The Multinational Enterprise in <br> the World Economy | 4 |
| Ec 445 | Comparative Economic Systems | 4 |
| Ec 447 | Economics of Transition | 4 |
| Ec 448 | East Asian Economic |  |
| Ec 450 | Development <br> Economics ofDevelopment | 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 ofDevelopment | 4 |

Subtotal: 16
Courses must be taken for a letter grade and must be graded C - or above.

## INSTITUTIONAL ECONOMICS UNDERGRADUATE CERTIFICATE

Institutional Economics focuses on the relationship between economic outcomes and the evolving structure and org anization 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 wisdom that (i) currently enrolled undergraduate students, (ii) postgraduate students, and (iii) members of the broader community bring to the classroom. Forstudents who are
majoring in Economics or QuantitativeEconomics, 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. Alternative electives 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 |
| :---: | :---: | :---: |
|  | Issues |  |
| Ec 345 | Marxist Political Economy | 4 |
| Ec 350U | Economics of Developing | 4 |
|  | Countries |  |
| Ec 417 | Women in the Economy | 4 |
| Ec 419 | Economics of Race and | 4 |
|  | Ethnicity |  |
| Ec 442 | The Multinational Enterprise in the World Economy | 4 |
| Ec 443/ESM | Global Environmental | 4 |
| 443 | Economics |  |
| Ec 445 | Comparative Economic Systems | 4 |
| Ec 446 | Institutional Economics | 4 |
| Ec 447 | Economics of Transition | 4 |
| Ec 448 | East Asian Economic | 4 |
|  | Development |  |
| Ec 456 | American Economic History: the | 4 |
| Ec 457 | American Economic History: the | 4 |
|  | 20th Century |  |
| Ec 465 | Labor Economics | 4 |

Subtotal: 16
Total Credit Hours: 28
Other Requirements:

- 16 of the required 28 credits must be taken in res idency with the Department of Economics at Portland State University.
- All courses must be taken for a grade (not $\mathrm{P} / \mathrm{NP}$ ), with a grade ofC- orbetter.
- 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

Admis sion to the Master's programin the Department of Economics is online at www.pdx.edu/admis sions/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 the option 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 Univers ity minimum TOEFL or IELTS requirements at www.pdx.edu/admissions/international/english-language-proficiency.
4. Recommendations: Three (3) letters of recommendation, at least two of which must be from economics professors.
5. Statement of Purpose: Approximately 500-word essay on goals and aspirations 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 transcriptsent 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-course core 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 have four options for completing theeconomics 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 of economics 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 of4 credits
Economics elective courses may be substituted by graduate courses fromother departments with prior Department of Economics approval.

## REQUIREMENTS

Core economics courses ( 44 credits)
Ec 570 Econometrics 4
Ec 571 Advanced Econometrics 4
Ec 575 Applied AdvancedEconometrics 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 and Data Analysis consists of four 4-credit courses for a total of 16
credits. There are three required courses and one elective course. Thecurriculum is des igned 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 prerequisitefor Ec 571. However, Ec 576 can be taken out ofs equence.

## 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 allocatenatural 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 |$\quad 4$

## Subtotal: 12

## Graduate Elective course (4 credits)

Any graduate Economics coursenumbered 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 graduate level elective

Though any Economics course fulfills the elective requirement, the following environmental and resource economics courses may be offered:

- Ec 532 Advanced EnvironmentalEconomics
- Ec 533 Resource Economics
- Ec 534 Business Environmental Management
- Ec 537 Public Utility Economics
- Ec 543 Global EnvironmentalEconomics


## Other Courses

Other graduate level elective
Courses from other 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 them with the knowledge to apply sustainable, integrated problem solving 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 professional backgrounds 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. Most graduate courses with a focus on sustainability or environmental issues will count as electives. For a list of pre approved electives see the GraduateCertificate in Sustainability website. Classes not on that list should beselected in consultation with the Graduate ProgramDirector as advance approval may be required.

## Core

| Ec 522 | Economics of Sustainability: <br> Theory and Practice | 4 |
| :--- | :--- | :--- |
| ESM 588 | Environmental Sustainability | 4 |


| Soc 588 | SocialSustainability Theory and | 4 |
| :--- | :--- | :--- |
| USP 588 | Practice <br> Sustainable Development <br> Practices | 3 |

Subtotal: 15
Note: The core classes can be taken in any sequenceand can also be taken after the elective courses.

Total Credit Hours: 22

## Combined Undergraduate and Graduate Degree

## 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 ofB
3.5 in economics courses numbered 499 and below, with a minimum grade ofC-
3.3 overall at PSU.

## ADMISSIONS CRITERIA

- BSQE majors may apply for the BSQE + MS program upon earning junior status ifon 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. Prior to the 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 cours es must be graded B or better.
- All undergraduate economics courses must be graded C- or better.
- No P/NP credit in required economics, mathematics and statistics classes 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 PSUsatisfied


## Please Note:

The Department of Economics awards Graduate Assistantships (GAs) on a competitive basis each year. BS + MS students who meet the admis sion 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.

## 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 phenomenawith 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 with in 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 from the 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 rais ing 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 Global Studies endeavors to foster a deep understanding of global is sues, such as socialjustice 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 As ian Studies and Latin American Studies. The department also offers a minor and seven undergraduate certificates 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 are important. Our students have also secured admission to top interd is ciplinary 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

Admission to the department is based on general admission to the University. See Admissions Requirements (p.8) for more information.

## B.A. IN INTERNATIONAL AND GLOBAL STUDIES

You can choose fromfourB.A. concentrations: two thematic, interdisciplinary options, in GlobalStudies and International DevelopmentStudies, and two with regional specialization, in AsianStudies and Latin American Studies.

- Global Studies
- International DevelopmentStudies
- 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 a core curriculum of international studies courses ( 24 credits); five electives from the Global Studies course list (20 credits); and two elective courses from the International Development Studies course list (8 credits).

## Core Courses (24 credits)

Intl201
Introduction to International Studies

| Intl296 | The United States and the World | 4 |
| :--- | :--- | :--- |
| Intl397 | Theory and Policy in <br> International Development | 4 |
| Intl407 | Seminar | 4 |
| Intl415 | Global Studies Theories | 4 |
| Intl | Understanding the International | 4 |
| $471 /$ Ling | Experience |  |
| 471 |  |  |

Intl470 Intercultural Leadership and Changecan substitute for Intl471 Understanding the International Experience.
Pre-requisite 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 Intl296


## Global Studies Electives ( 20 credits)

Students must take 20 credits from the GlobalStudies course list (seetable below).

| Intl317U | Topics in Asian Thought | 4 |
| :--- | :--- | ---: |
| Intl321U | Asia: Globalization and Identity | 4 |
| Intl323U | Asia:Tradition and Innovation | 4 |
| Intl | Women in the Middle East | 4 |
| 331U/WS |  |  |
| 331U |  | 4 |
| Intl332U | Islamic SocialMovements | 4 |
| Intl342U | Globalization and Conflict in <br> Latin America | 4 |
| Intl350U | The City in Europe <br> Intl360U | Bollywood: Communicating <br> Contemporary South Asia |
|  | through Cinema | 4 |
| Intl365U | Digital Globalization <br> Cyberwar \& Espionage <br> Intl366U | 4 |
| Intl367U | The Global Drug Trade <br> Globalization, Representation <br> Intl380U | and Difference in Media and |
| Intl391U | Film <br> Media and International | 4 |
| Intl452/PS | Relations <br> The European Union | 4 |
| In2 | Intercultural Leadership and | 4 |
| Intl470 | Change | 4 |
|  |  | 4 |

Consult with an Advisor for Intl 399 and Intl 410 courses that count for GlobalStudies courses.

Study Abroad courses can count towards Global Studies courses when approved through the Course Substitution process. See an Advisor for more details.

## Additional Electives (8 credits)

Majors must take eight credits of elective courses fromthe International Development Studies course list (see table below).

| Intl341U | Environment and Development in Latin America | 4 |
| :---: | :---: | :---: |
| Intl343U | Commodity Chains in Latin | 4 |
|  | America: From Silver to |  |
|  | Cocaine |  |
| Intl | Genderand International | 4 |
| 349U/WS | Development |  |
| 349 U |  |  |
| Intl | Amazon Rain Forest | 4 |
| 362U/Hst |  |  |
| 362 U |  |  |
| Intl364U | Modern Brazil | 4 |
| Intl | Post-colonial Studies of Africa | 4 |
| 372U/BSt |  |  |
| 372 U |  |  |
| Intl375U | Global Migration | 4 |
| Intl445/USP | Cities and Third W orld | 3 |
| 445 | Development |  |
| Intl460/PS | Political Development in | 4 |
| 460 | Modern Turkey |  |
| Intl461/PS | Politics ofEconomic Reform in | 4 |
| 461 | Modern Turkey |  |
| Int1490 | 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 Development Studies courses when approved through the Course Substitution process. See an Advis or 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 Department of W orld 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 cours es 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 InternationalDevelopment 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 globalhistory.

## REQUIREMENTS FOR B.A. IN INTERNATIONAL DEVELOPMENT STUDIES

International DevelopmentStudies majors must complete a core curriculum of international studies courses ( 24 credits); five electives fromthe International Development Studies course list ( 20 credits); andtwo elective courses from the Global Studies course list ( 8 credits).

## Core Courses ( $\mathbf{2 4}$ credits)

| Int1201 | Introduction to International | 4 |
| :--- | :--- | :--- |
| Int1296 | Studies <br> The United States and the World | 4 |
| Int1397 | Theory andPolicy in | 4 |
|  | International Development |  |
| Int1407 | Seminar | 4 |
| Int1415 | Global Studies Theories | 4 |
| Intl | Understanding the International | 4 |
| 471/Ling | Experience |  |
| 471 |  |  |

Int1470 Intercultural Leadership and Change can substitute for Intl471 Understanding the International Experience.
Pre-requisite requirements:

- Prerequisites for Intl 397 are Intl 201 and Intl 296
- Prerequisites for Int1407 are either Int1397 or Int1415
- Prerequisites for Intl 415 are Intl 201 and Int1 296


## International Development Studies Electives (20 credits)

Students must take 20 credits from the International DevelopmentStudies course list (see table below). Int1341U Environment and Development in Latin America
Intl343U Commodity Chains in Latin

Intl Genderand International 4
349U/WS Development
349 U
Intl Amazon Rain Forest
362U/Hst
362 U
Intl364U Modern Brazil 4
Intl
372U/BSt
372 U
Int1375U Global Migration 4
Int1445/USP Cities and Third World 3
445
Int1460/PS
460
Intl461/PS
461
Int1490

Development
Political Developmentin 4
Modern Turkey
Politics of Economic Reform in
Modern Turkey
Global Sustainable Development

4

Consult with an Advisor for Int1399 and Int1410 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 Advis or for more details.

## Additional Electives (8 credits)

Majors must take eight credits of elective courses fromthe Global Studies course list (see table below).
Int1317U Topics in Asian Thought 4

Int1321U Asia:Globalization and Identity 4
Intl323U Asia:Tradition and Innovation 4
Intl Women in the Middle East 4
331U/WS
331 U
Int1332U Is lamic Social Movements 4
Int1342U Globalization and Conflict in 4
Latin America
Intl350U The City in Europe 4
Intl360U Bollywood:Communicating 4
Contemporary South Asia
through Cinema
Int1365U Digital Globalization 4
Int1366U Cyberwar \& Espionage 4
Int1367U The Global Drug Trade 4
Int1380U Globalization, Representation 4
and Difference in Media and
Film
Intl391U Media and International
Relations
Int1452/PS The European Union 4
$\begin{array}{ll}\text { Int1470 } & \text { Intercultural Leadership and } \\ \text { Change }\end{array}$

Consult with an Advisor for Intl 399 and Intl 410 courses that count for GlobalStudies courses.

Study Abroad courses can count towards Global Studies courses when approved through the CourseSubstitution 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 demons trating proficiency through the Department of W orld 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 cours es used to satis fy the departmental major requirements (and minor orcertificate 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 departmentmajor 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 a core curriculum of international studies courses; an individualized curriculumof connected learning courses; and courses in their area of geographic concentration, to include:

## Core Courses ( 24 credits)

Intl201 Introduction to Internation 4 Studies
Intl216 Introduction to Asian Studies 0-4
Intl296 The United States and the World 4

| Intl407 | Seminar | 4 |
| :--- | :--- | :--- |
| Int1415 | Global Studies Theories | 4 |
| Intl | Understanding the International | 4 |
| $471 /$ Ling | Experience |  |
| 471 |  |  |

Students may double count Intl 216 for the major and Univers ity Studies Sophomore Inquiry; a Mentored Inquiry section is required.

Intl470 Intercultural Leadership and Changecan substitute for Intl471 Understanding the International Experience.
Pre-requisite requirements:

- Prerequisites for Intl 397 are Intl 201 and Intl 296
- Prerequisites for Intl 407 are either Intl397 or Intl415
- Prerequisites for Intl 415 are Intl 201 and Intl 296


## Connected Learning ( 20 credits)

At least 20 upper-division credits fromadvis or-approved courses. Connected Learning courses must have global/international content and must not focus on a specific region. (Exception: one course may focus on a region other than Asia.)

| Int1332U | Is lamic Social Movements | 4 |
| :---: | :---: | :---: |
| Intl | Gender and International | 4 |
| 349U/WS | Development |  |
| 349 U |  |  |
| Int1365U | Digital Globalization | 4 |
| Intl366U | Cyberwar \& Espionage | 4 |
| Intl367U | The Global Drug Trade | 4 |
| Intl375U | Global Migration | 4 |
| Intl380U | Globalization, Representation and Difference in Media and Film | 4 |
| Intl391U | Media and International | 4 |
|  | Relations |  |
| Intl397 | Theory and Policy in | 4 |
|  | International Development |  |
| Intl445/USP | Cities and Third W orld | 3 |
| 445 | Development |  |
| Intl490 | Global Sustainable Development | 4 |

Special Topics courses (399, 410), Seminars (407), and non-Intlclasses, as well as individualized Reading and Conference courses arranged with instructors may be substituted for specific courses listed above as long as the scope of the course is global/international. Allsuch courses must be approved by your Advisor before you register for the course.

## Regional Focus (20 credits)

At least 20 upper-division credits fromPSU courses focused on Asia. Students mustconsult with the faculty advis or for As ian Studies when choosing courses.
Special Topics courses (399, 410), Seminars (407), and other area-related 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.

## Language (0-27 credits)

Two years, orequivalent proficiency, of language study in one world language. Forstudents taking courses at PSU, second-year proficiency is defined by successful completion of the terminal course in the second-year languagesequence, or demonstrating proficiency through the Department of W orld Languages and Literature.

## Total Credit Hours: 64

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), whethertaken in the departmentor else where, mustbe graded Corabove. 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 dives into the continent's past, present, and future through the interdis ciplinary study of political-economy, cultures and religions, communication and media, gender and sexuality, migration, development, and environmental change.

## REQUIREMENTS FOR LATIN AMERICAN STUDIES

Students doing the Latin American Studies major must complete a core curriculumof international studies courses; an individualized curriculum of connected learning courses; and courses in their area of geographic concentration, to include:

## Core Courses ( $\mathbf{2 4}$ credits)

| Int1201 | Introduction to International <br> Studies | 4 |
| :--- | :--- | ---: |
| Int1240 | Introduction to Latin American | $0-4$ |
| Int1296 | Studies | The United States and the World |$\quad 4$

Intl Understanding the International 4
471/Ling 471

Experience

Students may double count Intl240 for the major and Univers ity Studies Sophomore Inquiry; a Mentored Inquiry section is required.

Int1470 Intercultural Leadership and Changecan substitute for Intl471 Understanding the International Experience.

Pre-requisite requirements:

- Prerequisites for Intl 397 are Intl 201 and Intl 296
- Prerequisites for Intl 407 are either Intl397 or Intl 415
- Prerequisites for Intl 415 are Intl 201 and Intl296


## Connected Learning (20 credits)

At least 20 upper-division credits fromadvis or-approved courses. Connected Learning courses must have global/international content and must not focus on a specific region. (Exception: one course may focus on a region other than Latin America.)

| Intl332U | Is lamic Social Movements | 4 |
| :--- | :--- | :--- |
| Intl | Gender and International | 4 |

349U/WS Development
349U
Intl365U Digital Globalization 4
Intl366U Cyberwar \& Espionage 4
Int1367U The Global Drug Trade 4
Int1375U Global Migration 4
Int1380U Globalization, Representation 4
and Difference in Media and
Film
Intl391U Media and International 4
Relations
Intl397 Theory and Policy in 4
International Development
Intl445/USP Cities and Third W orld
445 Development
Intl490 Global Sustainable Development 4
Special Topics courses (399, 410), Seminars (407), and non-Intl classes, as well as individualized Reading and Conference courses arranged with instructors may be substitutedfor specific courses listed above as long as the scope of the course is global/international. All such courses must be approved by your Advisor beforeyou register for the course.

## Regional Focus ( $\mathbf{2 0}$ credits)

At least 20 upper-division credits fromPSU courses focused on Latin America. Students must consult with the faculty advisor for Latin American Studies when choosing courses.

Special Topics courses $(399,410)$, Seminars (407), and other area-related 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 a language appropriate to thestudent's regional focus. For students taking courses at PSU, second-year proficiency is defined by successful completion of the terminal course in the second-y ear language sequence, or demonstrating proficiency through the Department of W orld Languages and Literature.
Total Credit Hours: 64
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 department or elsewhere, mustbe graded Cor above. Courses taken under the undifferentiated grading option (pass/no pass) will not be accepted toward fulfilling department majorrequirements.

## ACADEMIC ADVISORS

Information on courses and major requirements is available from CUPA and faculty advisors. Students should see an advis or as soon as they declare their major and meet regularly with adv is ors as they pursue their degree.

## CUPA Advisors:

CUPA Advis ing website; 503-725-9210

## Faculty Advisors:

Kimberley Brown, brownk@pdx.edu, 503-725-8194; 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 global dimens ion to any degree with a minor in International \& Global Studies.

## 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, plus two years of language study (or equivalent) in a world language.

| International | Studies Core Courses (12 credits) |  |
| :---: | :--- | :---: |
| Intl201 | Introduction to International | 4 |
|  | Studies |  |
| Int1296 | The United States and theWorld | 4 |
| Intl415 | Global Studies Theories | 4 |

Intl201 and Intl296 are required prerequisites for Intl415.

## Elective Cours es (16 credits)

Students must take 16 upper-division credits from the following tables of courses:

| Global Studies Course List (Social Justice, Human |  |
| :---: | :---: |
| Rights \& Global Media) |  |
| Intl317U | Topics in Asian Thought |
| Intl321U | Asia: Globalization and Identity |
| Intl323U | Asia: Tradition and Innovation |
| Intl | Women in the Middle East |
| 331U/WS |  |
| 331 U |  |
| Intl332U | Is lamic Social Movements |
| Intl342U | Globalization and Conflict in |
|  | Latin America |
| Intl350U | The City in Europe |
| Intl360U | Bollywood: Communicating |
|  | Contemporary South Asia through Cinema |
| Intl365U | Digital Globalization |
| Intl366U | Cyberwar \& Espionage |
| Int1367U | The Global Drug Trade |
| Intl375U | Global Migration |
| Intl380U | Globalization, Representation and Difference in Media and Film |
| Intl391U | Media and International |
|  | Relations |
| Int1470 | Intercultural Leadership and |
|  | Change |

International Development Studies Course List (Development, Health \& Environment)
Intl341U Environment and Development in Latin America
Intl343U Commodity Chains in Latin America: From Silver to Cocaine
Intl Genderand International 4
349U/WS Development
349U
Intl
Amazon Rain Forest
362U/Hst
362U
Intl364U Modern Brazil

| Intl | Post-colonial Studies of Africa | 4 |
| :---: | :---: | :---: |
| 372U/BSt |  |  |
| 372 U |  |  |
| Int1445/USP | Cities and Third W orld | 3 |
| 445 | Development |  |
| Intl 452/PS | The European Union | 4 |
| 452 ( 4 |  |  |
| Intl 460/PS | Political Development in | 4 |
| 460 | Modern Turkey |  |
| Intl 461/PS | Politics of Economic Reform in | 4 |
| 461 | Modern Turkey |  |
| Intl 490 | Global Sustainable Development | 4 |

Consult with a faculty or CUPA advisor for INTL399 and INTL 410 courses that count for minor electives.
Study Abroad courses can count towards elective courses when approved through the Course Substitution process. See a faculty or CUPA advis or 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 Department of W orld Languages and Literature.

## Total Credit Hours: 28

All courses used to satis fy the departmentalminor requirements, whether taken in the department or elsewhere, must be graded C or above.
Courses taken under the undifferentiated grading option (pass/no pass) will not be accepted toward fulfilling departmentminor requirements.

## ACADEMIC ADVISORS

Information on courses and minor requirements is available from CUPA and faculty advis ors. Students should see an advisor as soon as they declare their minor and meet regularly with advis ors as they pursue their degree.

## CUPA Advisors:

CUPA Advis ing website; 503-725-9210
Faculty Advisors:
Kimberley Brown, brownk@pdx.edu, 503-725-8194; 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.

## INTERNATIONAL AND GLOBAL STUDIES CERTIFICATES

The International and Global Studies department offers seven certificates that may be earned simultaneously with a B.A. or B.S. degree, or post baccalaureate. Certificates are available in:

- Global Studies,
- International DevelopmentStudies,
- African Studies,
- Asian Studies,
- European Studies,
- Latin American Studies,
- Middle East Studies,
- Contemporary Turkish Studies (Admission to the programis currentlysuspended.)


## ACADEMIC ADVISORS

Information on courses and requirements is available from CUPA and faculty advisors. Students should see an advisor as soon as they declare their minor and meet regularly with advis ors as they pursue their degree.

## CUPA Advisors:

CUPA Advising website; 503-725-9210

## Faculty Advisors:

Kimberley Brown, brownk@pdx.edu, 503-725-8194; 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 GLOBAL STUDIES (24 CREDITS)

A Certificate in Global Studies may be earned simultaneously with a B.A. orB.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 work. The 24 credits includetwo 4-credit Intl foundational courses and 16 credits of elective coursework.

Students completing an Internationaland Global Studies major or minor are not eligible to receive a global studies certificate.

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 (24 CREDITS)

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 consists of 24 credits including three core courses (12 credits) and three courses ( 12 credits) of elective coursework focused on international development.
Students completing an International and Global Studies major or minor are not eligible to receive an International DevelopmentStudies certificate.

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 to ward fulfilling departmental certificate requirements.

## CERTIFICATE IN AFRICAN STUDIES (28 CREDITS)

The A frican 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 certificate students must take:

- 28 credits of advisor-approved courses: discuss the options with an International \& Global Studies advisor.
- Two years, or equivalent proficiency, of a foreign language appropriate to the regional focus. 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 Department of W orld Languages and Literature.

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 to ward fulfilling departmental certificate requirements.

## CERTIFICATE IN ASIAN STUDIES (28 CREDITS)

The As ian Studies certificate focuses on the interd is ciplinary 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:

- 28 credits of advisor-approved courses: discuss the options with an International \& Global Studies faculty advisor.
- Two years, or equivalent proficiency, of a foreign language. Fors tudents taking courses at PSU, secondyear 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.
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 to wardfulfilling departmental certificate requirements.


## CERTIFICATE IN EUROPEAN STUDIES (28 CREDITS)

The European Studies certificate allows students to explore themes related to the continent's history, politics, people, economy, and culture from a multidisciplinary pers pective.

For the European Studies certificate students must take:

- 28 credits of advisor-approved courses: discuss the options with an International \& Global Studies advisor.
- Two years, or equivalent proficiency, of a foreign language appropriate to the regional focus. 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 W orld Languages and Literature.
All courses used to satisfy the departmental certificate requirements, whether taken in the departmentor elsewhere, must be graded Cor above. Courses taken under the undifferentiated grading option (pass/no pass)
will not be a ccepted towardfulfilling departmental certificate requirements.


## CERTIFICATE IN LATIN AMERICAN STUDIES (28 CREDITS)

The Latin American Studies certificateallows students to explore themes related to the continent's history, politics, people, economy, and culture from a multidisciplinary perspective.

For the Latin American Studies certificate students must take:

- 28 credits of advisor-approved courses: discuss the options with an International \& Global Studies advisor.
- Two years, or equivalent proficiency, of a foreign language appropriate to the regional focus. 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 W orld Languages and Literature.
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 (28 CREDITS)

The Middle East Studies certificateallows students to explore themes related to the continent's history, politics, people, economy, and culture from a multidis ciplinary perspective.

For the Middle East Studies certificate students must take:

- 28 credits of advisor-approved courses: discuss the options with an International \& Global Studies advisor.
- Two years, or equivalent proficiency, of a foreign language appropriate to the regional focus. 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 W orld Languages and Literature.
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)

Admission 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.74), Karl Miller Center, Room660. However, a study abroad experience is not required.

## Mark O. Hatfield School of Government

Birol Yesilada, Director
650 Urban Center
503-725-3257
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 School has also gained national prestige as one of the top 50 Public Affairs graduate programs in the nation, according to the 2016 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 Criminology \& Criminal Justice, Political Science and Public Administration departments. Although each programis distinct, their location under one roof affords students the unique opportunity for collaborative multi-disciplinary study.
The Hatfield Schooloffers both a Ph.D. programand a Master's degree with an interdisciplinary focus:

- The Public Affairs and Policy Ph.D. program(p.394)
- The Master's in Public Policy (p. 397)

The School consists of three academic departments:

- Department of Criminology and Criminal Justice (p. 375)
- Department of Political Science (p.413)
- Department of Public Adminis tration (p.421)
and seven institutes and centers:
- Criminal Justice Policy Research Institute (p. 399)
- Center for Public Service (p. 399)
- The National Policy Consensus Center (p.412)
- The Institute for Tribal Government (p. 399)
- The Nonprofit Institute (p.428)
- Center for Turkish Studies (p. 399)
- Center for Women's Leadership (p. 399)


## Doctoral Program

## PUBLIC AFFAIRS AND POLICY PH.D.

The Ph.D. in Public Affairs and Policy is an interdisciplinary programdesigned 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 bas is .

The degree programis administered by the Hatfield School of Government, butdraws on faculty fromthe entire College of Urban and Public Affairs. Faculty members are drawn from public adminis tration, political science, economics, policy sciences, and urban studies.
The curriculumfocus is governance, the integrated study of political, administrative, and policy processes. This curriculum is taught againstthe 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 cours ework, each field has additional specialization requrirements. The total number or credit hours required for the degree is 107 , dis tributed as follows:

- Core Coursework--18 credits
- Research Methods-- 24 credits
- Field Coursework--38 credits
- Dissertation--27 credits

As a cohort, first-year students take a series of six courses commonly referred to as "the core" and are examined on this material upon completion. During theirsecond 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 defenseof a dis sertation proposal, students advance to Ph.D. candidacy. The last remaining hurdle is the dissertation.

## Prerequisites

All students entering the doctoral programmust have completed a bas ic course in statistics either upon entering or within the first year of study. No degree credit will be awarded forthis coursework.

## Credit requirements

The Ph .D. in public affairs and policy requires 80 credit hours of required and electivecoursework. In addition, the studentenrolls in 27 credits for dissertation research and writing.
The credits are distributed as follows:
Core Coursework
Field of Specialization (Tracks-1- 38 3)

Research Methods
Dissertation credits
Subtotal: 107
To meet these credit requirements, relevant past academic coursework is recognized in these ways:
Up to 40 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/or experience in using quantitative or qualitative res earch methods may substitute one or more required res earch methods courses with other coursework with permission of their academic adviser.
Core courses andCredits
Core courses

| PAP611 | Normative Foundations of <br> Governance | 3 |
| :--- | :--- | :--- |
| PAP613 | Organization Theory and <br> Behavior | 3 |
| PAP 614 | Contemporary Governance | 3 |
| PAP616 | Policy Proces |  |
| PAP620 | Seminar on American Political <br> PAP 621 | Institutions <br> Comparative Political <br> Institutions |

Subtotal: 18

## Specialization fields (Tracks 1-3)

Students must choose one of the following three tracks as their primary domain of study.

## 1. Public Administration and Policy ( 38 credit hours)

Students focus on the functioning, management, and leadership of organizations in the public sector as well as the analysis of public policy. Required courses:
PA 534 Administrative Law 3

PS 559/USP Political and Economic 3
636 Decision-making
PAP 615 Adminis trative Process
or
PA $540 \quad$ Administrative Theory and Behavior
PAP 653 Policy Analysis

## 2. Politics and Public Policy (38 credit hours)

Students focus on the political and economic determinants as well as the analysis of public policy at the local, national, and international levels. Required courses:

| PAP 653 | Policy Analysis | 3 |
| :--- | :--- | :--- |
| PAP 656 | Advanced Political Economy | 3 |
| PAP 630 | Proseminar in International <br> Relations | 4 |
| PS 559/USP | Political and Economic | 3 |
| 636 | Decision-making |  |

## 3. Economics and Public Policy ( $\mathbf{3 8}$ credit hours)

Students focus on the understanding and application of economic theory to contemporary public policy and governance challenges, es pecially economic, fiscal, financial and commercial is sues. Required courses:
Ec 571 Advanced Econometrics
Ec 575 Applied Advanced Econometrics
Ec 580 Mathematical Economics
Ec 581 Advanced Microeconomics
Ec 584 Applications of Advanced 4

Ec 592 Applications of Advanced
Macroeconomic Theory
Ec 571, Ec 575 and Ec 580 may be waived as Track courses if used as ResearchMethods elective. Students must still complete 38 total field credits.

## Res earch 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

$$
\begin{array}{ll}
\text { PS } 593 & \text { Philosophy of the Social } \\
\text { Sciences }
\end{array}
$$

| PAP690 | Research Design for Politics and | 4 |
| :--- | :--- | ---: |
|  | Policy |  |
| PS 595 | Topics in Specialized Research | 4 |
|  | Methods for Political Science |  |
|  | or | 4 |
| Ec 570 | Econometrics | 12 |
|  | Electives |  |

Subtotal: 24

## Dissertation Research

Students must register for a minimum of 27 credits of PAP 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 18 credit hours of foundational core courses. Part B (field exam) covers all cours ework done in the student's specialization field (Tracks 1-3).

## Dissertation requirements

The dissertation process is designed to evaluate the student's ability to successfully conduct a significant, independent applied research project. The dissertation thesis 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 www.pdx.edu/hatfieldschool and https://cupa.pdx.edu/apply-now. Applications are accepted for fall admission only; the application deadline is 31 December and there is a late application deadline of 30 April. An early admission deadline for December 1 is offered for outstanding candidates seeking early admis sion.
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 ofFinancial 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 notreceiveda graduate or undergraduatedegree in an Englishspeaking territory
- A statement of intentup 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
- 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.


## INTERNATIONAL AGREEMENTS

The Hatfield School of Government is under a universitylevel memorandumof 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 Administration at Khon Kaen University (COLA) and the Department of International Relations at Cukurova University and welcomes HSOG graduate students as part of these partnerships. Graduatestudents seeking opportunities for cours ework, research, and professional development in the context ofdeveloping areas and emerging Asia and Turkey are encouraged to contact the Director of the Hatfield School for more information.

## PROGRAM RULES

A more comprehensive set of rules governing satisfactory completion of field area examinations, presentation of dissertation, and timely completion of doctoral program requirements appear in the GeneralHandbook for the Public Affairs and Policy Doctoral Programissued to incoming students and available online.

## 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 mustbe 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. Failure to regis ter without an approved leave may result in termination of a student's admis sion. Students may have no more than sixterms of approved leave.

## Grade requirement

A student who receives more than 9 credits of $\mathrm{C}+$ or below in all coursework 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 ofC + or below in one of the core course offerings during fall or winter terms may not proceed to take the core course offerings 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 number of research and teaching opportunities.

## Hatfield Residency Program

This program, conducted in cooperation with the Hatfield School's Executive Leadership Institute, 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 their educational objectives.

## Graduate rese arch ass istants hips

Dependent on available funds, a number of graduate research assistantships are available each year. Students must apply for these byFebruary 1 of the academic year in which the assistantships are desired. Assistantships pay tuition and a small additional stipend.

## Teaching opportunities

All doctoral students in the programare strongly encouraged to teach prior to completing theirPh.D. programs. There are a number of opportunities available in this regard.

## Teaching apprenticeships with a university faculty member

These duties can includeteaching one or more class sessions, as sistance in preparing courses, and correction of examinations.

## Teaching in the University Studies Program

Advanced doctoralstudents may also teach in sophomore inquiry coursework sponsored by the Hatfield School of Government. This coursework deals largely with citizen participation and leadership. Advanced doctoral students may also propose and teach a senior Capstonecourse at the undergraduate level. These are interdisciplinary community-based courses required of allPSU 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 institutions. The curriculumis des igned to respond to the need for advanced training in public policy analysis and leadership/advocacy to succeed in today's complexpolicy 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

## Courses andCredits

## Cohort Course

Students take the following course as part of the incoming cohort each fall quarter:
PAP 511 Introduction to Public Policy 3

PA 533
Public Policy: Origins and Process

## Policy Process andLeaders hip Core Courses

Students take the following four courses:
PAP 512 Introduction to Policy Advocacy 3
PS 515 Comparative Public Policy 4
PAP 514 Institutional Dynamics of Public 3
Policy
PA $579 \quad$ Policy Tools in Policy Design

## Policy Analysis Core Courses

Students take the following three courses and a 4-credit data analysis course of their own choosing:
PAP 653 Policy Analysis 3

PAP 513 Ethics and Public Policy 4
PAP 654 Policy Analysis Research 3
or
PA $554 \quad$ Policy Analysis Research

## Track Courses

Students choose one of the following two tracks as part of their course specialization work:

1. Policy Leadership/Adv ocacy Track: Students take 12 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.
2. Policy Analysis Track: Students take 12 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.

## Specializations

Students identify a policy is sue-area or sector and take 12 credits of courses relating to that sector in order to develop policy-domain specific knowledge as well as professional networking and experiential application opportunities.

## Professional Development Plan

Students work with their faculty advisor to prepare a career-oriented plan that outlines a pathway to professional development for the student based on a set of career goals and links that plan to theirMPP course of study. The plan is intended to provide an opportunity forstudents to build individual networks, establish job search plans, and prepare a professional portfolio. The plan is the basis of an exit interview with MPP faculty and Professional Advisory Board members.
PAP 508 Professional DevelopmentPlan 1-3

## Summative Policy Project

Students work with a single faculty member to complete a summative project, which can take oneof 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 of 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 1-3

## Prerequisites

All students entering the Master of Public Policy program must have completed a basic course in calculus and an introductory course in statistics. Students whose undergraduate degree is not in a related dis cipline may be asked also to complete an introductory course in public policy, public administration, or political science.

## Credit requirements

The Master of Public Policy programrequires 60 credit hours of required, elective, and professional development coursework.
The credits are distributed as follows:

| First-Year Cohort Course | 3 |
| :--- | ---: |
| Policy Analysis Core Courses | 14 |
| Policy Leadership Core Courses | 13 |
| Policy Analysis or Leadership | 12 |
| Track Electives |  |
| Policy Specialization Courses | 12 |
| Summative Poolicy Project | 3 |
| Professional Development Plan | 3 |

Subtotal: 60

## 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. 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 mustsubmit 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 forperiods 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 admis sion. 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.

## Professional Advisory Board

The MPP Professional Advisory Board is composed of policy professionals from the government, non-profit, and private sectors. They serve as invited members with a role of serving as an ongoing line of communicationbetween the programand those in service. The PABhelps MPP students to shape their professional goals, to identify networking opportunities, to find summative projectclients and experiences, and to maintain constant contact with the shifting demands of public policy education. Students will have both formal and informal opportunities to work with PABmembers.

## 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 OregonPublic 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 ofFinancial Support and Declaration of Finances (if International)
- International Applicants who currently reside in the United States with an $\mathrm{F}-1$ or $\mathrm{J}-1$ vis a 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 ofstudy (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
- The scores of the Graduate Record Examination (GRE). Please notethat you should make arrangements to take the GRE well in advance of the application deadline.


## RESEARCH CENTERS AND INSTITUTES

## Criminal Justice Policy Research Institute

550 Urban Center
503-725-4014
http://www.pdx.edu/cjpri/
The institute is a multi-disciplinary research unit serving the entire PSU community, but affiliated with the Criminology and Criminal Justice Division of the School of Government. It is designed to provide policy makers throughout thestate with a forumin which issues of policy and practice may be explored, using objective, performance-based criteria. It is also designed to bring together the varied resources of Portland StateUniversity and coordinate those resources with other institutions of higher education to address is sues emanating from the justice community. The institute has an external advisory board, representing a broad cross-section of justice agencies, which serves to focus attention on issues of concern to the community, state, and region.

Projects currently underway, or recently completed by faculty as sociated with the institute, include:

- National Evaluation ofSafe Start Promis ing Approaches,
- Project Safe Neighborhoods Gun Violence Reduction,
- Portland and Gresham Weed \& Seed Efforts,
- Evaluation ofOregonLaw Enforcement Traffic Stops,
- Public Perceptions of Oregon Law Enforcement,
- Risk Assessment in Portland Police Bureau's Domestic Violence Reduction Unit,
- TacticalEthics - Perspectives on Profiling Training, and the OregonLaw Enforcement Contacts Policy \& Data Review Committee
- Portland Police Bureau Neighborhood Involvement Locations (NI-Loc) Project.
Center for Public Service
570 Urban Center
503-725-8261
www.pdx.edu/cps
The Center for Public Service draws on theextensive expertise of faculty and students within the Public Administration, Political Science, and Criminology and Criminal Justice departments of PSU's Mark O. Hatfield School of Government, 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 ofdiscrete programs such as First Stop Portland (FSP), the Executive Seminar Program(ESP), and the Initiative for Community and Dis aster 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 non profit sector leaders throughout the Oregon/SW W ashington area, as well as in international venues such as Vietnam, Japan, China, Korea and Thailand. These offerings include an Executive MPA degree for experienced practitioners; custom-designed leadership development programs; and applied research and technical assistance across a wide range of fields including diversity and inclusion, change management, and organizational performance.

## 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 res earch and collates scholarship generated by others to create a knowledge-bank that can be used to advance the org anizational design, governance, and practice of nonprofit organizations. Emphas is is placed on applied research that generates knowledge of immediate relevance to address the needs and missions of nonprofits.
- Strengthens the capacity of nonprofit organizations in Oregon to engage in culturally appropriate evidence-based evaluation and assessment practices to enhance organizational performance and increase impact.
- Advances professional development 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.


## Institute for Tribal Government

## 570-T Urban Center

503-725-9000
http://www.pdx.edu/tribal-gov/
The Institute for Tribal Government, housed within the Center forPublic 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 issues. Tribal leaders are offered programs to meet their
own unique needs either with sessions at the Hatfield Schoolor at tribalsites. Programs are available for addressing federal Indian law, tribal government duties and res ponsibilities, tribal and state relations, the federal leg is lative process, federal judicial and administrative procedures, and effective tribal leadership strategies.

Certificate in Tribal Relations (CTR) Program: In addition to organization-specific training, the Institute also offers a 10 -month Certificate in Tribal Relations program. The cohort runs October-August and applications are due September 15th. This program is designed for midcareer professionals employed by local, state, federal, and regional government agencies, non-profit 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 three out-of-class learning experiences such as trips to W ashington, DC, Salem, OR, and tribal communities in order to better understand tribal policy making at multiple levels ofgovernance.

## Center for Turkish Studies

570-L Urban Center
503-725-8309
www.pdx.edu/turkish_studies_center/
The Center for Turkish 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 disciplines and come fromdepartments across Portland State University and other universities in the US, Europe, Turkey, and North Cyprus. Our mission is to foster collaboration between PSU and universities in Turkey, engage in academic research in social sciences and its application to policy making, org anize conferences, panel dis cussions and cultural activities for academic and public engagement. Weare committed to providing decision-makers, academics, and general public with innovative and objective analyses in key policy is sues pertaining to 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 for Turkish Studies enriches Portland State University's scholarly works and contributes to Portland State University's internationalization initiative.

## National Policy Consensus Center <br> 720 Urban Center 503-725-9077

www.pdx.edu/npcc

The National Policy Consensus Centeradvances the use of innovative collaborative governance methods in Oregon and nationally by providing collaboration services, university courses, professional training, and res earch. We help people work together collaboratively to develop public policy and implement community-based solutions. NPCCprovides 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 localeconomies and quality of life
- Increase public participation that has a collective impact on public issues
Education and Professional Training: We offer academic programs and customized professional training to prepare students and professionals to:
- Use consensus-seeking to resolve policy dis putes
- Apply collaborative approaches in their current professions
- Work in the fields of conflict resolution and public engagement
Applied Research and Development: 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
- Work with otherstates to advance the use of collaborative governance approaches nationwide
- Publish collaboration resource materials


## Center for Women's Leadership

665 Urban Center
503-725-2895
http://www.pdx.edu/womens-leadership/
The Center forWomen's Leadership, housed within the Mark O. Hatfield School of Government, is changing the way leadership looks from the ground up. Through targeted teaching programs for women and girls, community events, the Big Talk speaker series featuring notable women leaders, educational programming and skills trainings, our Center is building a diverse group of emerging women leaders in communities across the state. The Center works toward this by promoting scholarship that examines the presence and role of women in leadership, business, and public policy and by providing
diverse and inclusive service programs that will develop the next generation of women leaders who will serve the city, state, region and nation. Current programs include National Education for Women's (NEW) Leadership Oregon, a competitive intensive leadership skills training programfor women enrolled in higher education, with mentoring support and multiple future opportunities embedded in the structure and the Girls: Oregon, Action, Leadership, Service Summit Program, beginning with an annual conference forhigh school girls hosted at PSU with year long opportunities for connection and action. The Center promotes women's leadership through public and private sector outreach, hosting activities and awareness raising, collaborating with partner organizations, and highlights women's successes in our educational programming.

## 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 Urban Development
- 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 ofRealEstate Development
- M.U.R.P. - Master of Urban and RegionalPlanning
- M.U.S. - Master of Urban Studies
- Ph.D. - Urban Studies, Urban Studies: Regional Science

The Toulan Schoolof 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. TheM.U.R.P. degree is fully accredited by the Planning Accreditation Board. Interest in developingurban 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 is sues with a diverse faculty and student body in a nationally renowned planning school. Our programs 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 ofour programs are knowled geable abouthousing, community organizing, transportation, economic development, and environmental issues. 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 administration, 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 generaladmis sion to the University. See Admissions Requirements (p. 8) for more information.

## COMMUNITY DEVELOPMENT B.A./B.S.

The Community Development major is one ofjust 16 such programs nationwide, and the only oneof these whose campus is located in a city's Central Business District. According to the International As sociation for Community Development, CD is a "practice-based profession 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 oflocality, identity or interest, in urban and rural settings." PSU's curriculum is 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 interpers onal 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), state 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 their academic advisor. In particular, the field experience requires independentadvance planning.

Substitution of coursework is acceptable only by permission fromthe CD major coordinator; consult with your academic adv is or before pursuing a course substitution.

## MAJOR REQUIREMENTS

## Core cours es ( 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
USP 301U Introduction to Community 4 Development
USP 302 Theory and Philosophy 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
Development
USP 313U Urban Environmental Issues
USP 316 Community Organizing and
SocialChange

## 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.

| USP 350U | Inclusive Engagement |
| :--- | :--- |
| USP 430 | Participatory Research Methods <br> for Community Development |
| USP 440 | Measuring People and <br> Communities in the Urban <br> Context |
| USP 452 | GIS for Community <br> Development |

## 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 near theend 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 profes sionals. 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 resource site 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 and Public 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 thecurriculumhas changed. Theacademic advisor and CD major coordinator and the academic advisor can assist with aligning theold 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 yourselfto faculty members during office hours are great ways to getstarted.

## COMMUNITY DEVELOPMENT MINOR

## REQUIREMENTS

The minor in community developmentincluded 27 credits of cours ework. Courses taken under the undifferentiated grading option(Pass/No Pass) cannot be used to fulfill CD minor requirements. All courses used to satisfy theminor 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 Cours es

USP 300U Introduction to Urban Studies 4
USP 301U Introduction to Community 4
USP 302 Theory and Philosophy of
Community Development

A minimum of 15 credits of additionalUSP coursework must be taken. Us ing a study abroad experience to meet some of these electives requirement may be possible; consult with an Ed Abroad advisor, the CD major coordinator, or your academic advisor.

## REAL ESTATE DEVELOPMENT MINOR

The development and managementof real estate is a vital component of the urban economy. The RealEstate Developmentminor(RE) will provide education to students wanting to enter the industry. Minors develop skills to evaluate real estate development proposals and understand how real estate development fits into regional planning and economic 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 ofelectives. All courses used to satisfy the minor requirements (and minor or certificate requirements), whether taken in the department or elsewhere, mustbe gradedC- or above. The GPA for courses used to fulfill the minor requirements must be 3.0 or higher. Cours es taken under the undifferentiated grading option (pass/no pass) will not be accepted toward fulfilling minor requirements.

| Required Cours es (19 credits) |  |  |
| :---: | :---: | :---: |
| USP 311U | Introduction to Urban Planning | 4 |
| USP 312U | Urban Housing and | 4 |
|  | Development |  |
| USP 323U | Real Estate Development and | 4 |
|  | Finance |  |
| USP 431/Ec | Urban Economics | 4 |
| 431/RE 431 |  |  |
| USP 438/RE | Real Estate Law | 3 |
| 438 |  |  |
| Electives (6 credits) |  |  |
| RE 410 | Property \& As set Management | 4 |
| Fin 439 | Real Estate Valuation I | 4 |
| USP 301U | Introduction to Community | 4 |
|  | Development |  |
| USP 324U | Healthy Communities | 4 |
| USP 325U | Community and the Built | 4 |
|  | Environment |  |
| USP 326U | NeighborhoodConservation and | 4 |
|  | Change |  |
| 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 UrbanDevelopment 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 issues and challenges of making places sustainable. To reach theSUD 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. Cours es taken under the undifferentiated grading option (Pass/No Pass) will not be accepted toward fulfilling minor requirements.

## Required Cours es ( 15 credits)

| USP 313U | Urban Environmental Issues | 4 |
| :--- | :--- | :--- |
| USP 324U | Healthy Communities | 4 |
| USP 325U | Community and the Built | 4 |
|  | Environment |  |
| USP 490 | Green Economics and | 3 |
|  | Sustainable Development |  |

## Electives ( 9 credits)

Choose three courses from the 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 <br> Development <br> Introductionto Transportation | 4 |
| :--- | :--- | :--- |
| CE 351 | Engineering |  |
| CE 371 | Environmental Engineering | 4 |
| ChLa 301U | Chicano/Latino Communities | 4 |
| CR 304U | Participating in Democracy | 4 |
| Ec 332U | Economics of Environmental | 4 |
| ESM 355U | Issues | Understanding Environmental |
| ESM 356U | Sustainability I <br> Understanding Environmental | 4 |
| ESM 428 | Sustainability II <br> Urban Ecology | 4 |
|  | Un |  |


| Geog 347U | Environmental Is sues and Action | 4 |
| :--- | :--- | :--- |
| Geog 412 | Global Climate Change Science <br> and Socio-environmentalImpact | 4 |
|  | Assessment |  |
| Geog 447 | Urban Streams | 4 |
| Geog 462 | Sense ofPlace | 4 |
| Hst 337U | History of American Cities | 4 |
| Intl | Cities and Third World | 3 |
| 445/USP | Development |  |
| 445 | Environmental Ethics | 4 |
| Ph1 310U | Politics ofthe Environment | 4 |
| PS 319U | EnvironmentalSociology | 4 |
| Soc 465 | Populationand Society | 4 |
| USP |  |  |
| 419/Soc 441 | Commercial District | 3 |
| USP 427 | Revitalization |  |
| USP | Cities and Third World | 3 |
| 445/Intl 445 | Development <br> USP 451 | Community Economic |
|  | Development |  |

## Total Credit Hours: 24

## Graduate programs

With overhalfofthe world's population now living in urban areas, the challenge of creating and maintaining urban places as high quality, healthy, vitalplaces 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 professional leadership and new knowledge in support of this first "urban century".

## GRADUATE ASSISTANTSHIPS

Financial aid programs are administered without regard to race, creed, national origin, handicap, marital status, or sex The school awards a significant number of graduate assistantships 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 admission 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 Toulan School of 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 resume, a standardized GRE or GMAT exam. MRED students are admitted for fall term only, with three application deadlines: November 1 (early admission), February 1 (scholarship eligibility), and April 1 (priority admission). Admission is handled jointly between the School of 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 essay 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 threerecommendations, 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 pers onal 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 essay 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 Real Estate Development (MRED) is a profes sional 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, eng ineering, design, apprais al, and other disciplines. To deliver this education, the MRED degree is a joint degree of the School of Business Administration and the Toulan School of Urban Studies and Planning.
The objective forthis 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 classes 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 basis 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 RealEstate Development W orks hop culminating experience. The degree requirements (p. 126) are listed in the School ofBusiness 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 urban phenomena ( 21 credits). Each student also defines a field area which is pursued through cours ework ( 25 credits) and individual research leading to a thesis ( 6 credits). In addition, the degree provides for a specialized option in social and policy research.

## CORE-AREA REQUIREMENTS

The urban core-area requirements for the M.U.S. degree include the following courses:

## Courses

| USP 613 | Urban Economic and Spatial | 3 |
| :--- | :--- | :--- |
| USP 614 | Structure <br> History and Theory of Urban <br>  <br> USP 617 | Studies |
|  | The Sociology and Politics of | 3 |
| USP 630 | Urban Life | 3 |
| USP 634 | Research Design |  |
| USP 683 | Qualitative Analysis | 4 |
|  |  | 4 |

## FIELD-AREA REQUIREMENTS

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. programor on a substantive issue of particular concern to the student. Relevant courses are available 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 thes is.

## MASTER OF URBAN AND REGIONAL PLANNING (M.U.R.P.)

The Master of Urban and Regional Planning program prepares students for careers 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 andurban 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 professional 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 | 4 |
| :--- | :--- | :--- |
| USP 541 | Dynamics of Planning Practice | 3 |
| USP 550 | Participatory Planning | 3 |

## Methods sequence

USP 531 Geographic Information Systems 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 4 Urban Studies
USP 525 Design Analysis in Planning
USP 553 Legal Processes in Urban Planning
Workshops
USP 558
Planning Workshop
USP 559 Internship Seminar Pathway and Electives 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. W orkshop projects are often implemented by clients to the benefit of their communities.

## FIELD PAPER/PROJECT

Students may choose to prepare an original res earch paper or project in their field of specialization. The res earch paper or project is meant to demonstrate a student's ability to integrate and apply material fromhis or her cours ework 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, butare nonetheless required to complete USP 559 Internship Seminar.

## URBAN STUDIES PH.D.

Dynamic metropolitan regions are increasingly seen as central to economic, social, and politicaldevelopment throughout the world. Composed of one or more central cities, suburbs, and adjacent agricultural and natural areas, they are the essential 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 issues frommulti-disciplinary and interdisciplinary points of view. Through participation in classes and seminars and supervised research and teaching activities, Ph.D. students prepare for careers in institutions of higher education and in res earch organizations.

## CORE REQUIREMENTS

Entering students in the Ph.D. in urban studies take the following common courses:

## Courses

| USP 613 | Urban Economic and Spatial | 3 |
| :--- | :--- | :--- |
| USP 614 | Structure |  |
|  | History and Theory of Urban <br> Studies <br> USP 617 | The Sociology and Politics of |
|  | Urban Life | 3 |
| USP 630 | Research Design | 4 |
| USP 634 | Data Analysis I | 4 |
| USP 683 | Qualitative Analysis | 4 |
| USP 697 | Research Design2 | 4 |

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 organizing 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 forplanning analysis and evaluation. As a pioneer in state land use law and a place in which planning discourse is highly visible, Oregon 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 usable knowledge and scientific uncertainty; and the analysis of change in complex socio-technical-biophysical 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 forstudy and analysis. Within the broad field of community development, students can address such topics as ethnic and neighborhood history, housing andeconomic 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 ofdemographic analysis, with particular attention to the methods of data collection, techniques ofdemographic 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 social demography use demographic data to 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, internationalmigration, fertility and family planning, marriage and divorce, public policy uses of demographic data and estimates, and demographic methods.

## Gerontology

addresses the social is sues, 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 Ins titute on Aging. Adult development and aging is approached froma multidis ciplinary 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 nationalreputation 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 development, are addressed. The Center for Urban Studies and Institute for Portland Metropolitan Studies offer research opportunities in this field.

## Trans portation

includes planning, policy, forecasting, measurement, 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 travelbehavior, the costs and benefits of transport facilities, the operation of transportation facilities, equity impacts of transport and the
effects of transportation plans and policies. There are opportunities to work on res earch 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 multidis ciplinary approach. These groups work closely with students to develop coherent specializations that prepare each individual to do doctorallevelresearch in that field.

## URBAN STUDIES—REGIONAL SCIENCE PH.D.

Regional science brings a variety of socialscience perspectives to bear in analyzing the growth and development of metropolitan areas, states, and regions. The regional science programshares 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 transportation field area the supporting methods courses might include coverage of demand modeling, cost-benefit analysis, 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 regional science 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. $\mathrm{Ph} . \mathrm{D}$. students are also required to take a minimum of 27 dis sertation 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 considered to have fulfilled the internship requirement. Such advanced standing credit will be included in the $24-$ credit maximum for all advanced standing; only profes sional work completed within seven years of the date the degree is granted can be included.

Requirements with regard to both the pattern of coursework and total credits must be satisfied prior to either advancement to candidacy 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 request exemption from the course. Permis sion is granted only after obtaining written verification from the 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 ofby-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 forperiods in which they are absent by approved leave. Taking 1 credit per term during the regular academic year will constitute continuous enrollment. Failure to reg is ter without an approved leave may result in termination of student admission.

## Grade require ment

A student who receives 9 credits of grades below B- in all coursework attempted after admis sion to an urban studies
graduate degree programwill be dropped from that 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 es tate development, transportation, and urban design are offered by the Toulan School of Urban Studies and Planning. Admission to these programs require an undergraduate degree at an accredited university and a GPA that meets university graduate admission requirements.

## APPLIED SOCIAL DEMOGRAPHY GRADUATE

 CERTIFICATE
## CORE

| USP | Populationand Society | 4 |
| :--- | :--- | :--- |
| 519/Soc 541 |  |  |
| USP 520 | Applied Demographic Methods I | 4 |
| USP 522 | Practicumin Applied <br>  Demography | 4 |

Subtotal: 12

## FOCAL AREA

Choose one elective from the list below:

| Age 516 | Families and Aging | 4 |
| :--- | :--- | :--- |
| Age 558 | Perspectives on Aging | 3 |
| Age 562 | Global Aging | 3 |
| Ec 550 | Economics ofDevelopment | 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 |  |
| Soc 585 | MedicalSociology | 4 |
| USP 515 | Economics: Applications in | 4 |
|  | Urban Studies | 4 |
| USP 521 | Applied Demographic Methods | 4 |
|  | II |  |
| USP 523 | Real Estate DevelopmentI | 4 |
| USP 526 | Neighborhood Conservation and | 4 |
|  | Change |  |
| USP 544 | Urban TransportationPlanning | 3 |
| USP 572 | RegionalEconomic | 3 |
| USP 573/RE | Development | Real Estate Economics |
| 573 |  | 4 |
| USP 615 | Economic Analysis ofPublic | 4 |
|  | Policy |  |


| Subtotal: 4 |  |  |
| :---: | :---: | :---: |
| PROFESSIONAL METHODS |  |  |
| Choose one elective fromthe list below: |  |  |
| Geog | Geographic Information Systems | 4 |
| 588/USP | I: Introduction |  |
| 591 |  |  |
| Geog | Geographic Information Systems | 4 |
| 592/USP | II: Advanced GIS |  |
| 592 |  |  |
| Geog 596 | Introduction to Spatial | 4 |
|  | Quantitative Analysis |  |
| Geog 597 | Advanced Spatial Quantitative | 4 |
|  | Analysis |  |
| PHE 521 | Quantitative Research Design and Analysis | 3 |
| Soc 593 | Quantitative Methods | 4 |
| USP 531 | Geographic Information Systems (GIS) for Planners | 4 |
| USP 543 | Geographic Applications to | 4 |
|  | Planning |  |
| USP 634 <br> USP 654 | Data Analysis I | 4 |
|  | Data Analysis II | 4 |
|  |  | al: 4 |
| Total Credit Hours: 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 Grid Work |  |
| USP 518 | Energy and Society | 3 |
| USP 569 | Sustainable Cities and Regions | 3 |
| USP 574 | Socio-Technical Change in the | 4 |
|  | City |  |
| USP 582 | Sustainable Transportation | 3 |
| USP 625 | 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 Economics | 4 |
| :---: | :---: | :---: |
| Ec 570 | Econometrics | 4 |
| Ec 571 | Advanced Econometrics | 4 |
| Ec 572 | Time Series Analysis and Forecasts | 4 |
| Ec 575 | Applied AdvancedEconometrics | 4 |
| ETM 525 | Strategic Planning | 4 |
| ETM 530 | Decis ion Making | 4 |
| ETM 531 | Technology Assessment \& Acquisition | 4 |
| 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 Management | 3 |
| PA 556 | Public Contract Management | 3 |
| PA 557 | Operations Research in Public Administration | 3 |
| PA 558 | Managing Public Projects and Programs: From Local to Global | 3 |
| 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 Practices | 3 |
| USP 615 | Economic Analysis of Public Policy | 4 |
| USP 634 | Data Analysis I | 4 |
| Core |  |  |
| PA 567 | Energy Resources Policy and Administration or | 3 |
| USP 534 | Green Buildings | 3 |
| Total Credi | ours: 15 |  |
| GERONT | GY GRADUATE CERTIFIC |  |
| The Graduate Certificate in Gerontology provides multidisciplinary specialized training for postbaccalaureate and graduates 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 organization.

## COURSE REQUIREMENTS FOR THE GRADUATE CERTIFICATE PROGRAM:

## Three required classes

| Age 556 | Health Aspects of Aging | 4 |
| :---: | :---: | :---: |
| Age 558 | Perspectives on Aging | 3 |
| Psy 562 | Psychology of Adult Developmentand Aging | 4 |
| Soc 569 | Sor ${ }_{\text {Sociology of Aging }}$ | 4 |

## For MSW students the three (3) required cours es are:

Age 558 Perspectives on Aging 3
SW 544 Mid-Life and Beyond 3
SW 574 Social W ork 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 fromthe following, or other aging-specific courses, as available.

A good rule ofthumb in determining if a course is agingspecific, is if aging, elderly, lifecourse or older adult are in the title.
Age $516 \quad$ Families and Aging 4
Age 523 Business and Aging 4
Age 557 NationalLong-termCare Policy 3
Age 556 Health Aspects of Aging 4
Age 559 Economics of Aging 3
Age 560 MentalHealth and Aging 3
PHE $561 \quad$ Cultural Variations in Aging 3
Age 562 Global Aging 3
Age 563 Service Learning in Nicaragua: 3
Enhancing Communities for an Aging Society
Soc $566 \quad$ Sociology of Dying and Death 4
SW 544 Mid-Life and Beyond 3
SW 569 SocialW ork in End-of-Life and 3 Palliative Care
SW 574 SocialW ork with Older Adults

| USP 564 | Political and Adminis trative | 3 |
| :--- | :--- | :--- |
|  | Issues in Aging |  |
| USP 585 | Housing Environments for Older | 3 |
|  | Adults |  |

Note: Age 556 is an elective option for MSW students only.

There may be other approved classes - they will be listed on the web each quarter at www.pdx.edu/ioa/classschedule

Students may select only 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 Administration: Health Administration, and Public Policy, can also specialize in gerontology with theright plan and academic advising.

## REAL ESTATE DEVELOPMENT GRADUATE CERTIFICATE

Dramatic changes in the real es tate industry over the past decade require an advanced set of interdis ciplinary skills for commercial and residential real estate practitioners in the private, public, and non-profit sectors. TheGraduate 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 from the Toulan School of Urban Studies and Planning, and TheSchool of Bus iness. Classes combine theoretical, empirical, and case studies methods, and involve assistance fromPortland metropolitan area real estate industry professionals. Allrequired classes are taughtduring evening hours to accommodate the needs of working professionals, as well as full-time students.
The Graduate Certificate in Real Estate 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 DevelopmentI | 4 |
| USP 546 | Real Estate DevelopmentII | 3 |
| USP 612 | Community, Planning, and | 4 |
|  | Ethics |  |

Subtotal: 15

[^5]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 |  |  |
| :---: | :---: | :---: |
| RE 522 | Real Estate Finance II | 4 |
| 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 | NeighborhoodConservation 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 | Transportation 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 \& Asset Management | 3 |
| RE 539/RE | Real Estate Valuation I | 4 |
| 539S |  |  |
| RE 548 | Real Estate Market Analysis | 3 |
| RE 573/USP | Real Estate Economics | 4 |
| 573 |  |  |
| Fin 552 | Investments | 4 |
| Fin 554 | Alternative Investments | 2 |

Total Credit Hours: 24
TRANSPORTATION GRADUATE CERTIFICATE

## CORE

| USP 544 | Urban Transportation Planning | 3 |
| :--- | :--- | :--- |
| USP 556 | Urban Transportation: Problems <br> and Policies | 3 |
| USP 570 | Transportation and Land Use | 3 |

Subtotal: 9

## 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> Transportation | 3 |
| USP 543 | Geographic Applications to <br> Planning | 4 |
| USP | Geographic InformationSystems | 4 |
| 591/Geog | I: Introduction |  |
| 588 | Public Participation GIS |  |
| USP 593 | Pu |  |

Subtotal: 12
Total Credit Hours: 21
URBAN DESIGN

| Arch 521 Urban Design Methods <br> Arch 532 History and Theory of Urban <br> Design <br> Arch 531 Studies in Contemporary Urban <br>  Design <br> USP 513 Public Space  <br> USP 575 Urban Design Workshop | 4 |
| :--- | :--- | :--- |
| Total Credit Hours: 20 |  |

The Center for Urban Studies, established in 1966, is a multidisciplinary research unit that promotes and facilitates research and community service for faculty and students on urban andmetropolitan is sues. CUS research on urban and regional systems and policy includes is sues such as planning and growth management, sustainability, energy, transportation, economic development, and housing and equity. Center for Urban Studies faculty are frequently engaged with policy-making institutions at the metropolitan, regional, and national levels, and CUS provides an infrastructure for the community to access the expertise and resources of the university. Faculty scholarship is presented at public forums and in academic journals and conferences. Private, public, and nonprofit organizations, as well as the community, can access expertise and services through CUS.
The center houses the PSU-China Innovations in Urbanization Program, promoting dialogue and exchanges among professionals, students, and scholars in the U.S. and China.

## Center for Real Estate

631 SW Harris on, Room 270
503-725-5175
https://www.pdx.edu/realestate
In 2004, the Center for Real Estate was formed as a partnership between PSU's acclaimed Schools of Urban Studies and Planning and Business Administration to manage the real estate programs at Portland State and serve as the vital link between the University and thereal es tate community. Consisting of an Executive Director, an Academic Director, and a ProgramManager, the Center staff work with employers to not only meet their internship and employment needs, but also provide them with valuable updates on the real es tate industry through the Center's annual real estateconference.

The Center's PSU RealEstate Quarterly publication showcases articles on innovation in the realestate industry and trends affecting the real es tate market, regional planning and the regional economy.

The Center supports four real estate degree programs at Portland State University: a Master of Real Estate Development, a Graduate Certificate in RealEstate Development, and an Undergraduate Minor in Real Estate Development. Faculty fromboth the Nohad A. Toulan School of Urban Studies and Planning and the School of Business Adminis tration teach the courses within each program.

Center address: School ofBus iness Administration, 631 SW Harris on Street, Room 270.

## Institute of Portland Metropolitan Studies

320 Urban Center

503-725-4045
https://www.pdx.edu/metropolitan-studies
The Institute of Portland Metropolitan Studies (IMS) is a neutral source of information and analysis about the is sues facing the metropolitan region. A service and resource center in the College of Urban and Public Affairs at Portland State University, the Institute's mission is to advance theeconomic, environmental, and social goals of the Portland metropolitan region by gathering and disseminating credible information, convening regional partners, and stimulating dialogue and action about critical regional is sues. IMS also serves as a portal to other resources of highereducation for the region's communities.

The IMS sponsors research, holds forums and seminars, and gathers and disseminates data about the outcomes most important to the leaders and citizens of the Portland metropolitan area. By engaging students in its work, IMS offers opportunities to learn about regional is sues and contribute to creative approaches to our most important challenges.

The IMS has an external governing board thatensures that its activities are aligned with the priorities of the leaders and residents of the region. Drawn fromthroughout the metropolitan region and fromamong private, public, and nonprofit sectors, the IMS fosters regional collaboration and dialogue among the region's key community leaders. It is a resource for all departments at PSU and collaborates with higher education institutions across the state.

## Political Science

650 Urban Center
503-725-3920
www.pdx.edu/political-science/

- B.A., B.S.
- Minor
- Minor in Law and LegalStudies
- 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 administration, 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 Univers ity. 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 fromthe Department of Political Science. All courses used to satisfy political science major requirements, whether taken at PSU or els ewhere, must be graded C or above. Students must complete a minimum of 20 credits of politicalscience coursework at PSU.

There are four different options forstudents 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 exposure 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 residenceat PSU.

## REQUIREMENTS

## Lower Division Requirements

Three courses from the following four options (12 credits)

United States Government
or
PS 102
United States Politics

PS 204
Comparative Politics
PS 205
International Politics
Introduction to Political Theory
PS 208
Introduction to Political Theory

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 cours es from the following four options (12 credits)
PS 101 United States Government 4
PS $102 \quad$ Or $\quad 4$
PS 204 Comparative Politics 4
PS 205 International Politics 4
PS 208 Introductionto Political Theory 4

## 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 $419 \quad$ Political Reform 4
PS 431 State and Local Politics 4
Additional electives ( 20 credits, minimum of 12 in Political Science)
Political Science options:
PS 310 How to Win a U.S. Political 4
Campaign
PS 312 Legis lative Process
PS 313U The Power Game: A Simulation of Washington Politics

| 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 | 4 |
| PS 380U | Women and Politics | 4 |
| PS 381U | Women's Leadership | 4 |
| PS 412 | The Pres idency | 4 |
| PS 413 | Congress | 4 |
| PS 414 | Issues in Public Policy | 4 |
| PS 416 | Political Parties and Elections | 4 |
| PS 417 | Interest Groups | 4 |
| PS 418 | Contemporary Political Protest in | 4 |
|  | America | 4 |
| PS 419 | Political Reform | 4 |
| PS 421 | The Supreme Court and | 4 |
| PS 424 | American Politics | 4 |
| PS 427 | Law, Politics, and Society | 4 |
| PS 429 | The Politics of Public Opinion | 4 |
|  | American Immigration Politics | 4 |
| PS 431 | \& Policy |  |
| PS 435 | State and Local Politics | 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 same time to fulfill the elective requirements.

| Public Administration options: |  |  |
| :---: | :--- | ---: |
| PA 311U | Introduction to Civic <br> Engagement | 4 |
| PA 312U | Foundations of Community <br> Leadership | 4 |
| PA 313U | Fundamentals of Public Service <br> PA 320U | Introductionto Nonprofit |
| PA 412 | Management <br> Civic Engagement: The Role of <br> Governing Institutions | 4 |
| PA 413 | Civic Engagement:The Role of | 4 |
| PA 414 | Individuals <br> Civic Engagement: The Role of | 4 |
| PA 417 | Social Institutions <br> PA 425 Ethical Leadership <br> Grantwriting for Nonprofit | Organizations |
| Field Experience (8 credits) |  |  |
| PS 404 | CooperativeEducation/Internship | 8 |

Courses not required for the Public Service Option, but recommended for those interestedin public service careers:

| Comm | Media Literacy | 4 |
| :--- | :--- | :--- |
| 312U |  | 4 |
| Comm | Communication in Groups | 4 |
| 313U |  | 4 |
| 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 | 4 |
|  | SocialChange |  |
| USP 317U | Introduction to International | 4 |
| USP 386U | Community Development |  |
| USP | Portland Pastand Present | 4 |
| 419/Soc 441 | Concepts ofCommunity | 4 |
| USP 428 | 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

PS 102

PS 204
PS 205
PS 208
Upper Division Requirements
Two courses from the following options ( 8 credits)
PS $410 \quad$ Political Economy of 4
Development
International Organization 4
International Law 4
International Environmental 4
Politics and Law
International Political Economy
Global Food Politics and Policy
PS $477 \quad$ 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 353U | Introductionto Latin American Politics | 4 |
| :---: | :---: | :---: |
| PS 354U | Introductionto Asian Politics | 4 |
| PS 355U | Introductionto African Politics | 4 |
| PS 361U | Introduction to the Politics of the Middle East | 4 |
| PS 362U | Arab-Israeli Conflict | 4 |
| PS 373 | Violence, Rebellion, and Civil War | 4 |
| PS 460/Intl | Political Development in Modem | 4 |
| 460 | Turkey |  |
| PS 461/Intl | Politics of Economic Reform in | 4 |
| 461 | Modern Turkey |  |
| PS 466 | Politics of China | 4 |
| PS 471 | Gender \& Politics: A | 4 |
|  | Comparative Perspective |  |
| PS 472 | Democratization and | 4 |
|  | Authoritarianismin the Middle |  |
|  | East and North Africa |  |
| PS 473 | Government and Politics of Arab North Africa | 4 |
| PS 474 | Democracy and Development in Latin America | 4 |
| PS 479 | Transitions to Democracy | 4 |
| PS 483 | Justice in the Modern World | 4 |
| Non-Political Science electives |  |  |
| Two courses from the following options (8 credits) |  |  |
| Ec 340 | International Economics | 4 |
| Ec 442 | The Multinational Enterprise in the World Economy | 4 |
| Ec 445 | Comparative Economic Systems | 4 |
| Ec 447 | Economics ofTransition |  |
| Ec 450 | Economics ofDevelopment | 4 |
| Intl397 | Theory and Policy in | 4 |
|  | International Development |  |
| Intl | Cities and Third World | 3 |
| 445/USP | Development |  |
| 445 |  |  |
| Intl 490 | Global Sustainable Development | 4 |
| USP 312U | Urban Housing and | 4 |
|  | Development |  |
| USP 317U | Introduction to International | 4 |
|  | Community Development |  |
| USP | Population and Society | 4 |
| 419/Soc 441 |  |  |
| USP 490 | Green Economics and | 3 |
|  | Sustainable Development |  |
| Res earch 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 Political Science faculty member from the list below who agrees to oversee the PS 405 project, offer educational 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. Forstudents 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 the ID Track option's basic educational goals. Students must independently locate an internship opportunity, identify a faculty member from the list below who will overseethe internship, sign offon 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 ofSCH 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 notsubstitute for other requirements in the ID track option.

| PS 404 | Cooperative Education/Internship <br> or | $1-12$ |
| :--- | :--- | ---: |
| PS 405 | Reading and Conference | $1-6$ |
|  |  | Subtotal: 48 |

## POLITICAL SCIENCE HONORS PROGRAM

The honors program is 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 admission 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 cours ework. 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 supervise the research.

## REQUIREMENTS

Political science honors students complete all of the cours ework required for the standard major, but honors cours ework must include the following:

| Required Courses |  |  |
| :---: | :--- | ---: |
| PS 411 | Advanced Overview of Political | 4 |
| PS 491 | Science <br> Testing Theories in Political <br> Pcience | 4 |
| PS 403 | Honors Thesis | 12 |

Thesis 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 ofboth programs, although these students have the option 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
PS 204
Comparative Politics
PS 205
International Politics Introduction to Political Theory



| Soc 417 | Law \& Society:The Sociology | 4 |
| :--- | :--- | ---: |
| of Law | 3 |  |
| USP 455 | Land Use: Legal Aspects | 3 |
| USP 468 | Oregon Land Use Law |  |
|  | Electives approved by Law and <br>  <br>  <br>  <br> Legal Studies advisor (maximum <br> 8 credits) |  |

## Total Credit Hours: 28

For law and legal studies minors who are also majoring or minoring in political science, at least three electives (12 credits) must be applied solely to the law and legal studies minor. In order to count toward fulfillment of the minor, courses must be passed with a grade of Cor above.

CAMPAIGNING TO WIN A U.S. POLITICAL CAMPAIGN UNDERGRADUATE CERTIFICATE

## 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 stressful 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 dynamic lands cape of a modern campaign. While theseskills 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 thereal 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-groundedunderstanding of the mechanics anddynamics of the campaign process and its linkages with the party system and the broader political system.

## Who Should Attend

This certificate program is 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 runat 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 environmentof 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 <br> The Politics ofPublic Opinion | 4 |
| PS 427 | 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 ofPublic Opinion | 4 |
| Comm | Persuasion | 4 |
| 314U |  | 4 |
| Comm 420 | Political Communication | 4 |
| PS 331 | Oregon Politics | 4 |
| PS 413 | Congress | 4 |
| PS 417 | Interest Groups | 4 |
| PS 475 | Comparative Political Parties and <br> Elections | 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 candidate or ballot-measure campaign. Students who havepreviously worked on a campaign can apply for a waiverofthis 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 lessons 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 focused course of study on women leaders across disciplines, with an emphasis 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 also requires participation in a skillbuilding seminar (PS 381) designed 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 | Indigenous Women Leadership |
| PA 312U | Foundations of Community <br> Leadership | 4 |
| PS 425/WS | Women and the Law | 4 |
| 424 | Gender \& Politics:A | 4 |
| PS 471 | Gomparative Perspective <br> WS 307 | Resistance, Activism, and Social <br> Change |
| 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 scienceafter finishing their master's degree at PSU. The professional track is designed for otherstudents - 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 dis ciplinary backgrounds. The programadmits graduate students during the fall term. Procedures and deadlines for applications are provided on the programwebsite.
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.
- Meas les Vaccine Form
- Official TOEFL scores if the applicantdoes 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 program that provides students with the theories, research skills, and practicalunderstanding ofgovernmentand politics necessary 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 mostcompetitive Ph.D. programs. Forstudents 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 original research question, design and carry out an appropriate study for answering the question, and communicate the findings to a scholarly community.


## REQUIREMENTS

Master's degreestudents 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 res earch 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 required or elective courses taken by students in the Ph.D.preparation track. Coursework, including credit for work on the master's thesis (seebelow), is dis tributed as follows:

## First Year Cours ework

Fall
PS 511
Advanced Overview of Political Science
PS 590 Introduction to Graduate School: Skills for Scholarly Success

PS 5XX $\begin{array}{ll}\begin{array}{l}\text { Field Seminar } \\ \text { or }\end{array} & 4\end{array}$
PS 5XX Political Science Elective 4
Winter
PS 594/PAP
690
PS 5XX
Policy
Political Science Elective
4

PS 5XX
Field Seminar
or
PS 5XX
Political Science Elective
Spring
PS 591
Testing Theories in Political
4
Science
Thes is

| PS 5XX | Field Seminar <br> or | 4 |
| :---: | :--- | :--- |
| PS 5XX | Political Science Elective | 4 |

## Second Year Cours ework

Fall

| PS 503 | Thesis | 3 |
| :--- | :--- | :--- |
| PS 5XX | Political Science Elective | 4 |

PS $588 \quad$ Political Scientist 2

Professionalization
or
Internship
Winter
PS 5XX Political Science Elective 4
PS 503 Thesis 3
PS 589 How to Teach and Present Social 2 Science Research
or
PS 504 Internship
Spring
PS 5XX Political Science Elective 4
PS 503 Thesis 2
The following courses qualify as Field Seminars:
PS 520 Seminar on American Political Institutions
PS 530 Proseminar in International 4
Relations
PS 569 Comparative Political 4
Institutions
PS 507 Normative Foundations of 4
Governance

## Thesis

The final requirement for the degree is themaster's thesis-an original investigation thatdemonstrates 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 termof 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 thesis 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 ofB- or
above. No more than two online classes can becounted toward the fulfillment of degree requirements. Students are required to meet with or email their advisors to approve their classes before each term.

## Total Credit Hours: 54

## Public Administration

650 Urban Center
503-725-3921
www.pdx.edu/public-administration/

- Minor in Civic Leadership (p. 421)
- M.P.A.(p.423)
- M.P.A.: Health Administration(p.424)
- M.N.L. (p. 427)
- E.M.P.A.(p. 426) (p. 427)
- Graduate Certificates:
(p. 427) (p. 427)
- Nonprofit \& Public Management (p. 427)
- Sustainable Food Systems (p. 144) (Participating Department with UrbanStudiesand Planning)
- Collaborative Governance (p. 425)
- Energy Policy \& Management (p. 410)(Participating Department with Urban Studies and Planning) (p. 427)
- M.P.P.: Master of Public Policy (p. 397) (Participating Department with Hatfield School of Government)
- P.A.P.Ph.D. (p. 394) (Participating Department with Hatfield SchoolofGovernment) (p. 345)

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, urban studies and planning, gerontology, and public health. Adjunct faculty with appropriate academic credentials and significant professional experience in government, nonprofit, and health organizations also contribute to the department.

The graduate programs offeredunder the Departmentof Public Administration 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 professional experience. 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 Master of Public Administration, theMaster of Public Administration: Health Administration and the Executive Master of Public Administration degrees are accredited by NASPAA (the Network of Schools of Public Policy, Affairs and Administration).

## Doctoral students

See the graduate programwithin the Hatfield School of Government for details under the Doctor of Philos ophy in Public Affairs and Policy (p. 394).

## 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 must complete 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 regis tration. 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 Capstone courseorby an independently developed and approved community-based learning experience.

## REQUIREMENTS

| Required (12 credits total): |  |  |
| :--- | :--- | :--- |
| PA 311U | Introduction to Civic | 4 |
| PA 312U | Engagement <br> Foundations of Community <br> Leadership | 4 |

PA 311U Introduction to Civic

4

| PA 415 | Civic Leadership Integrative Seminar | 4 |
| :---: | :---: | :---: |
| Civic Leadership electives ( 8 credits needed, choose two from below): |  |  |
| PA 313U | Fundamentals ofPublic Service | 4 |
| PA 412 | Civic Engagement:The Role of Governing Institutions | 4 |
| PA 413 | Civic Engagement:The Role of Individuals | 4 |
| PA 414 | Civic Engagement: The Role of Social Institutions | 4 |
| PA 417 | Ethical Leadership | 4 |
| Other electives (8 credits needed, choose two from below): |  |  |
| CCJ 350U | Ethical Leadership in Criminal Justice | 4 |
| Comm $313 \mathrm{U}$ | Communication in Groups | 4 |
| ELP 318U | Introductionto Educational Leadership in Public Schools | 4 |
| ELP 350U | Introduction to Leadership for Sustainability | 4 |
| PA 314U | Students as Leaders | 4 |
| PA 315U | Managing People for Change | 4 |
| PA 316 | Leadership in New Student Programs | 3 |
| PA 320U | Introduction to Nonprofit Management | 4 |
| PA 425 | Grantwriting for Nonprofit Organizations | 4 |
| PS 312 | Legislative Process | 4 |
| PS 318U | Media, Opinion, and Voting | 4 |
| PS 325U | Politics and the Legal 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 P | ograms |  |

## ADMISSION REQUIREMENTS

In determining admis sion to the DepartmentofPublic 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 ofevidence, 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 admis sion status. Exceptions are
occas ionally made to this requirement when supported by other compelling evidence.
2. Three independentassessments of the applicant's ability to performadequately in graduate studies and potential for high-level performance in public service. The three letters of assessment, 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 orby 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 ifthe applicant has earned an undergraduate degree in the United States.
5. All degrees offered by the Department ofPublic Administration require the submis sion of a Statement of Purpose from 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-administration/public-administration-graduate-programs-and-admissions-criteria. b. The EMPA admission 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/public-administration/graduate-certificates.

Students may apply for admis sion any time throughout the calendar year. The Department of Public Administration maintains the same application deadlines published for the Univers ity 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 classes, a waiver must be submitted for approval to the departmentcurriculum committee 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 Administration in Health Adminis tration (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.

## 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 | Adminis trative Law | 3 |
| PA 540 | Adminis trative Theory and | 3 |
|  | Behavior |  |
| PA 551 | Analytic Methods in Public | 3 |
|  | Administration I |  |
| PA 552 | Analytic Methods in Public | 3 |
|  | Administration II |  |
| PA 582 | Public Budgeting | 3 |
| PA 585 | Financial Management in the | 3 |
|  | Public Sector |  |
| PA 590 | Human Resource Management in the Public Sector | 3 |

PA 585 may be substituted with an economics course approved by adviser

## Skill Development (9)

Three of the following:

| PA 525 | Grantwriting for Nonprofit <br> Organizations |
| :--- | :--- |
| PA 536 | Strategic Planning <br> PA 545 |
| OrganizationalDevelopment |  |
| PA 549 | Cross-cultural Communication in <br> the Public Sector |
| PA 554 | Policy Analysis Res earch <br> ProgramEvaluation and |
| PA5 556 | Management |
| PAblic Contract Management |  |
| P58 | Managing Public Projects and <br> Programs:From Local to Global <br> Managing Employee |
| PA 56 | Manformance in the Public Sector <br> Performan |

PA 594

> Enhancing Diversity in the Workplace

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 experience is offered under two options and is available to students only after they have completed at least 42 credits in their master's program.

## Option 1

Intended for students who have had limited or no administrative experience.
PA $509 \quad$ Organizational Experience 1-6
Option 2
For those students who have had at least three years of fulltime adminis trative or management experience in public or nonprofit organizations.

$$
\text { PA } 512 \quad \text { Case Analysis }
$$

## Field of Specialization (15)

The MPA programoffers the following formal fields of specialization: nonprofit management, natural resources policy and adminis tration, local government, global leadership and management, and human resource management. Students may also work with their advis or 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 of specialization"formwith a proposed programofstudy. The specialization and program of study may be changed basedupon 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.
Human Resource Management: Two required and three elective courses.

Students are encouraged to work with their advisors 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 satis factorily complete one course the primary focus of which is diversity. This does not require additional credit hours or cours ework beyond the 60 credit requirement and can include courses taken as skill development or specialization classes. Courseoptions include, butare not limited to the following.

| PA 514 | Global Leadership and <br> Management | 3 |
| :--- | :--- | ---: |
| PA 523 | Nongovernmental Organizations: | 3 |
|  | Nonprofits on the World Stage |  |
| PA 529 | Nonprofit Field Study in Oaxaca, | $3-6$ |
|  | Mexico |  |
| PA 544 | International Field Experience | 3 |
| PA 547 | Culture, Values and Leadership | 3 |
| PA 549 | Cross-cultural Communication in | 3 |
|  | the Public Sector |  |
| PA 593 | Civil Rights for Public Managers | 3 |
| PA 594 | 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 Administration: Health Administration degree. Students admitted to this degree are required to complete 60 credits of coursework. For students interested in geriatrics, gerontology, and the administration 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) <br> PA 511 <br> Public Administration | 3 |  |
| :--- | :--- | :--- |
| PA 513 | Administrative Ethics and <br> Values <br> or | 3 |
| HSMP 573 | Values and Ethics in Health | 3 |
| PA 533 | Public Policy: Origins and <br> Process | 3 |
| PA 534 | Administrative Law <br> or | 3 |
| HSMP 577 | Health Care Law and Regulation | 3 |
| PA 540 | Administrative Theory and <br> Behavior | 3 |


|  | or |  |
| :---: | :---: | :---: |
| HSMP 541 | Organizational Behavior in Health Service Organizations | 3 |
| PA 551 | Analytic Methods in Public | 3 |
|  | Administration I |  |
| PA 552 | Analytic Methods in Public | 3 |
|  | Administration II |  |
| PA 582 | Public Budgeting | 3 |
| PA 590 | Human Resource Management in the Public Sector | 3 |
|  | or |  |
| HSMP 580 | Health Services Human | 3 |
|  | Resources Management |  |
|  | Health Administration | 3 |
| 570/HSMP |  |  |
| 570 |  |  |
| HSMP 571 | Health Policy | 3 |
| HSMP 574 | Health Systems Organization | 3 |
| HSMP 586 | Introduction to Health | 3 |
|  | Economics |  |

## 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 thatcourse 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 must complete at least 30 credits that are health care specific by graduation. Consult with your advis or to verify acceptability of any courses counted towards the specialization that do not have a PAH prefix.

## Integrative Experience (6)

The integrative experience is offered under two options and is available to students only after they have completed at least 42 credits in their master's program.

## Option 1

Intended for students who have had limited or no administrative experience, or those who wish to complete an applied field experience.
PAH Practicum 1-6 509/HSMP
509

## Option 2

For those students who have had at least three years of fulltime adminis trative or management experience in public,
nonprofit, and/orhealth care organizations. Advisor approval required.

$$
\text { PA } 512 \quad \text { Case Analysis 3-6 }
$$

## Diversity

At some point within their programofstudy students must satis factorily complete one course the primary focus of which is diversity. This does not require additional credit hours or cours ework 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 Leadership and <br> Management | 3 |
| :--- | :--- | ---: |
| PA 523 | Nongovernmental Organizations: <br> Nonprofits on the World Stage | 3 |
| PA 529 | Nonprofit Field Study in Oaxaca, | $3-6$ |
|  | Mexico |  |
| PA 544 | International Field Experience | 3 |
| PA 547 | Culture, Values and Leadership | 3 |
| PA 549 | Cross-cultural Communication in | 3 |
|  | the Public Sector |  |
| PA 593 | Civil Rights for Public Managers | 3 |
| PA 594 | 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 Governance
PA 576 Collaborative Governance
Process and Systems
USP 584 Negotiation in the Public Sector

## Elective Courses

Choose two: Other courses may be counted for credit by approval of the faculty adviser.

| CR 512 | Foundations of Conflict | 4 |
| :--- | :--- | :--- |
|  | Resolution |  |
| CR 515 | Negotiation | 4 |
| CR 518 | Psychology of Peace and | 4 |


| CR 523 | Dialogue Across Differences |
| :---: | :---: |
| CR 524 | Advanced Mediation |
| CR 526 | Advanced Intercultural Conflict Resolution |
| PA 519 | Civic Capacity |
| PA 543 | Creating Collaborative Communities |
| PA 547 | Culture, Values and Leadership |
| PA 549 | Cross-cultural Communication in the Public Sector |
| PA 553 | Sustainable Development Policy and Governance |
| PA 558 | Managing Public Projects and Programs: From Local to Global |
| PA 563 | Citizens and Administration |
| PA 570 | Environmental and Natural Resource Leadership |
| PAP 512 | Introductionto Policy Advocacy |
| PAP 514 | Institutional Dynamics of Public Policy |
| SW 541 | Societal, Community and Organizational Structures and Processes |
| SW 593 | Practice and Leadership with Communities and Organizations I |
| USP 550 | Participatory Planning |
| ENERGY POLICY AND MANAGEMENT GRADUATE 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 interdis ciplinary certificate. They are Public Administration(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.

## CORE COURSE

One of the following:

| PA 567 | Energy Resources Policy and <br> Administration <br> or | 3 |
| :--- | :--- | :--- |
| USP 534 | Green Buildings | 3 |


| 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 Governance | 3 |
| PA 573 | Smart Grid and Sustainable Communities:Making the Smart Grid Work | 3 |
| USP 518 | Energy and Society | 3 |
| USP 582 | Sustainable Transportation | 3 |

Subtotal: 6-8

## PROFESSIONAL SKILLS COURSES

Two courses required

Ec 526
Economics of Regulation
Ec 527
Ec 528
Ec 530
Ec 569
Ec 570
Ec 571
Ec 572

ETM 525
ETM 530
ETM 531

ETM 534
ETM 540
ETM 545
PA 536
PA 551
Cost-Benefit Analysis
Project Evaluation

Administration I
PA 552 Analytic Methods in Public Administration II
PA $554 \quad$ Policy Analysis Research
PA $555 \quad$ ProgramEvaluation and
Management
PA 556 Public Contract Management 3
PA 558 Managing Public Projects and
Programs: From Local to Global
SySc 514
SystemDynamics
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 <br> Practices | 3 |
| :--- | :--- | :--- |
| USP 615 | Economic Analysis of Public | 4 |
| USP 634 | Policy |  |
| Data Analysis I | 4 |  |

Subtotal: 6-8
Total Credit Hours: 15-19
EXECUTIVE M.P.A.
The Executive MPA offers a work-centered curriculum with a focus on taking leadership initiative. Students are required to have 10 years ofs ignificant work experience. The programis offered in a cohort model which facilitates course sequencing that maximizes learning that carries over from one course to another. 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 | Adminis trative 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 |

Subtotal: 39

## Capstone Requirement

Students will register for the following two courses to complete their capstone, a culminating project intended to demonstrate 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

## 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 program in either full-time or part-time status.

The programis comprised of 54 credits.
Coursework will include a core area 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 |
| :--- | :--- |
| PA 521 | History AndFoundations of the <br>  <br> Nonprofit Sector |
| PA 513 | Administrative Ethics and Values |

## Choose one:

PA 547 Culture, Values and Leadership 3
PA 549 Cross-cultural Communication in the Public Sector
PA 594
Enhancing Diversity in the Workplace
PA 593 Civil Rights for Public Managers
SW 539 SocialJustice in Social Work
Subtotal: 12
CORE: FUNDAMENTALS OF NONPROFIT M ANAGEMENT

| PA 522 | Governance of Nonprofit <br> Organizations | 3 |
| :---: | :--- | :---: |
| PA 540 | Adminis trative Theory and <br> Behavior | 3 |
| PA 526 | Fundamentals ofFundraising in <br> Nonprofit Organizations | 3 |
| PA 524 | Financial Management in | 3 |
| Subtotal: 12 | Nonprofit Organizations |  |

Subtotal: 12
CORE: ANALYTIC SKILLS

Analytic Methods in Public

PA 552

PA 555
Analytic Methods in Public 3

Administration II
ProgramEvaluation and Management
Subtotal: 9

## ADVOCACY, POLICYM AKING, AND COMMUNITY CHANGE

| Required course |  |  |
| :---: | :---: | :---: |
| PA 538 | Advocacy and Political | 3 |
|  | Participation by Nonprofit |  |
|  | Organizations |  |
| Choose one elective from the following: |  |  |
| PA 543 | Creating Collaborative | 3 |
|  | Communities |  |
| PA 519 | Civic Capacity | 3 |
| PA 533 | Public Policy: Origins and | 3 |
|  | Process |  |
| PA 534 | Administrative Law | 3 |
| PS 524 | Law, Politics, and Society | 4 |
| PS 517 | Interest Groups | 4 |
| PS 559/USP | Political and Economic | 3 |
| 636 | Decision-making |  |
| USP 528 | Concepts of Community | 3 |
|  | Development |  |
| USP 584 | Negotiation in the Public Sector | 4 |
| CR 515 | Negotiation | 4 |
| CR 523 | Dialogue Across Differences | 4 |

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 Management consists 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 organizations with the knowledgeand
skills necessary to be successful in carrying outtheir administrative responsibilities.

## REQUIREMENTS

| Required cours es (6) |  |
| :---: | :--- |
| PA 511 | Public Administration |
| PA 540 | Adminis trative Theory and |
|  | Behavior |

## Elective courses (15)

Students must take five courses, and should meet with an advis or to plan a suitable complement of courses to meet their individual interests and professional development needs. Substitutions may be made with the permiss ion 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 ofNonprofit | 3 |
|  | Organizations |  |
| PA 536 | Strategic Planning | 3 |
| Finance and Budgeting |  |  |
| PA 524 | Financial Management in | 3 |
|  | Nonprofit Organizations |  |
| PA 525 | Grantwriting for Nonprofit | 3 |
|  | Organizations |  |
| PA 526 | Fundamentals ofFundraising in | 3 |
|  | Nonprofit Organizations |  |
| PA 582 | Public Budgeting | 3 |
| PA 583 | Advanced Budgeting Concepts and Techniques | 3 |
| PA 585 | Financial Management in the | 3 |
|  | Public Sector |  |
| 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 | Volunteerismand Volunteer | 3 |
|  | Management |  |
| PA 594 | Enhancing Diversity in the | 3 |
|  | Workplace |  |
| PA 598 | Values-based Management I | 3 |
| Community Building and Communication |  |  |
| PA 541 | Social Entrepreneurship | 3 |



The Department of Public Administration cooperates with other units within the Hatfield School of Government to offera 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.394). For details, see the programdescriptions.

## RESEARCH CENTERS AND INSTITUTES

## 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 issues related to
aging. Our research is funded by federal, state, and private sources, with projects designed to advance knowledge that serves an aging society. Educational programs are offered at the undergraduate, postbaccalaureate, master's, and doctoral levels. The IOA 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-term care;

- community-based care, such as as sisted living and adult foster home;
-global aging in developing countries;
-planning for age-friendly communities;
-aging services and policies;
- applied demography;
- changing family structures;
-research methods.


## Degree and Training Programs

The Institute on Aging offers courses and areas of specialization in gerontology for undergraduate, 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 curriculum in 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 Oregon Gerontological Association.

## Graduate Programs.

Students froma wide range of dis ciplines can complement their degree by completing the graduate certificate in gerontology, a postbaccalaureate programfor those seeking additional education in aging studies. Examples of degree programs that might be able to add aging as an area of emphas is include Urban Studies, Public Policy, Public Health, Social Work, Speech and Hearing Science, and Business.
The Graduate Certificate in Gerontology may be completed as a stand-alone programfor students who have completed an undergraduate degree.

## Undergraduate Programs.

The OHSU-PSU School of Public Health offers a B.A. in Health Studies with a concentration in Aging Services. Students fromother undergraduate programs may take gerontology courses offered through this program.

## Lifelong Learning

The Senior Adult Learning Center (SALC) provides opportunities for continuous intellectual enrichment and personal growth of older adults. Oregon residents 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.
The Retired Associates of Portland StateUniversity is an affiliated membership organization open to anyone aged 50 or older and sponsored by the Institute on Aging. It provides fellowship for those interested in lifelong learning and leadership opportunities.

## 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 testservice 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 center of training and knowledge for solutions to problems in applied demography, including population estimates, projections, geospatial analysis, and census-taking.

## 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 taxrevenue; better land use planning; appropriations for various state and federal program funds, and for other public policy priorities including education, public health, and redis tricting. PRC faculty additionally engage in activities including specialestimates or local area censuses, and projections for school, library, utility, and other service districts, and technical assistance with redistricting.
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 localexperts. SDC collaborates with the Census Bureauto improve the quality of Oregon's data by supporting the decennial census, geographic updates, and other programs through outreach and engagement.
As a member of the Federal-StateCooperative Program for PopulationEstimates (FSCPE), the PRC is a state liaison with the U.S. Census Bureau for issues 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

Graduate Certificate in Applied Demography is a postbaccalaureate program for students seeking to specialize in population studies. The certificate can be completed as a standalone programor integrated into a course of study in any graduate program at PSU.

## Directories

## Portland State University Board of Trustees

The Portland State University Board of Trustees is a 15 member 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 ofthe 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 employmentand 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. All actions 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 Presidentof the University is an exofficio, non-voting member of the Board. In addition, the Board must include one faculty member, one staffmember, 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 consecutive terms. All trustees, except for the President, are appointed by the Governor of Oregon, subject to confirmation by the OregonSenate. A list of the current trustees' terms of office is here.
Current Members of the PSU Board of Trustees

## Portland State University

Faculty members are lis ted with their programs. The dates in parentheses indicate the beginning of academic service at Portland State University. The earliest dateshown is 1955, the year in which Portland State became a degreegranting institution.

## Office of the President

Stephen Percy (2014) Ph.D.
President;Professor of PoliticalScience.Ph.D. 1981
Indiana University.

## Office of Athletics

Valerie Cleary (2014) M.S.
Athletic Director.M.S. 2003 California State University, Long Beach.

## 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 Univers ity 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; Professor of English and Women Gender and Sexuality Studies. Ph.D. 1981 University of Pennsylvania.

Shelly Chabon (2008) Ph.D.
Vice Provost for Academic Pers onnel \& 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 ofDenver.

Vanelda Hopes (2012) M.Ed.
Chief of Staff. 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 StateUniversity.

## 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.
Associate Director of Teaching, Learning, \& Assessment. Ed.D. 2018 University ofPortland.
Molly A. Griffith (2008) M.S.
Associate Director, Faculty Support and Emerging Technology. M.S. 2008 Portland State University.

Scott Robis on (2016) Ph.D.
Associate Director, eLearning Design. Ph.D. 2007 Ohio University.

Kevin Berg (2016) J.D.
Project Manager. J.D. 1997 Univers ity of W ashington.

Sarah Berry (2020) Ph.D.
Instructional Des igner. 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 Go in (2014) M.F.A.
Course Builder Specialist. 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 Des igner. M.A. 2003 Portland State University.
Andrew F. Lawrence (2014) M.A.
Course Support-InformationTechnology 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 Des igner. M.Ed. 1997 Kent State University.
Harold McNaron (2021)M.S.
Teaching, Learning, and A ssessment 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.
MichaelMillard (2011) B.A.
Administrative Program Assistant. B.A. 1992 Briar Cliff
University.
Lindsay Murphy (2017) M.A.
Instructional Des igner. M.A. Literature \& Language, emphasis:Teaching English at Community College 2012 MarymountUniversity.
Toai Nguyen (2014) B.S.
Course Builder Specialist. B.S. 2007 Portland State University.
Julie Savage-Lee (2019)
Instructional Designer. B.A. 2005 Emers on College.
Vince Schreck (2005) Ed.D.
Instructional Des igner. Ed.D. 2004 Portland State University.

Sophie Soprani(2017) B.A.
Communications Specialist. B.A. 2015 Pomona College.
Mark Terui (2010) M.A.
Instructional Des igner. M.A. 2001 Pepperdine University.
Jaime R. Wood (2016) M.A., M.F.A.
Teaching Associate. M.F.A. 2010 Eastern Washington University.

## Advising and Career Services

Ilka Bailey (2016) M.Ed
Advising Director-School ofBusiness, M.Ed 2001 Seattle University.

Kate Constable (2010) LCSW
Advis ing Director-Society \& Identity Pathway. MSW 2003 Portland State University.

Martha Dyson(2010) Ph.D
Advising Director-Language, Culture, and Meaning Pathway. Ph.D 2009 Drew University.

Greg Flores (2008) M.S.
Associate Director of Career Services - M.S. 2008 Portland State University.

RandiP. Harris (2009) M.S.Ed.
Director, Trans fer \& Returning Student ResourceCenter \& ProgramDirector, Office of Student Success - M.S. Ed 2013 Portland State University.

Rebecca Hunt Ingersoll(1995) M.S.
Director of Initiatives - M.S. 1997 Portland State University.

Anna Law (2010) M.Ed
Interim Associate Vice Provost of Advising and Career Services \&
Advising Director-Design, Creativity and Performance Pathway. M.Ed 1993 St. Mary's College of California.

Lynell Spencer(2015) M.S.
Advising Director-Urban, Public, and Global Affairs Pathway. M.S. 2015 Portland StateUniversity.

JodiStiegemeyer(2010) M.A.
Advising Director-Engineering, Computer Science, Math \& Phys ics Pathway. M.A. 2003 Cal Poly San Luis Obispo.

Melissa Yates (2011) Ph.D.
Advising Director-Health, Science, \& the Earth Pathway. PhD 2007 University of Illinois Urbana-Champaign.

## International Affairs

Ron L. Witczak(1995) B.A.
Executive Director, International Affairs. B.A. 1991
Oregon State University.

Jeff Baffaro (2001) B.A.
Director, International Special Programs. B.A. 1978
Portland State University.
Lindsay J. Benstead (2017) Ph.D.
Director, Middle East Studies Center. Ph.D. 2008
Univers ity of Michigan.
David Brandt (2011) B.A.
International Scholar \& Faculty Adviser. B.A. 1985
Whitman College.
Jonna Lynn Bransford (2015) M.Ed.
International Student Advisor, International Student \&
Scholar Services. M.Ed. 2011 Portland State University.
PaulBraun (2014) M.A.
ProgramManager, International Special Programs. M.A.
2014 Portland State University.
Debra Z. Clemans (1996) M.A.
Finance Officer; Director ofFulbright \& Boren Programs.
M.A. 1995 Portland StateUniversity.

Skye Clifford, (2017) M.A.
Education AbroadCoordinator, Education Abroad. M.A.
2006 Univers ity ofFreiburg.
Alyse Collins (2004) M.A.
Senior Advis or, Education Abroad. M.A. 2007 Portland State University.
Joshua N. Davis (2008) B.A.
Assistant Director, International Student \& Scholar
Services. B.A. 2002 Pacific University.
RachelDietz (2014) M.S.Ed.
International StudentLife Advis or.M.S.Ed. 2011
University of W is consin.
Hannah Fischer (2016) M.P.A.
Faculty-Led ProgramCoordinator, Education Abroad.
M.P.A. 2016 Portland State University.

Jennifer Hamlow (2012) M.A.
Director, Education Abroad. M.A. 2002 De Paul
University.
Emily Harper (2015) M.A.
International Student Advisor. M.A. 2010Union
University.
Julie Haun (1995) M.A.
Director, Intensive English Language Program;
Instructor in English as a Second Language. M.A. 1995
Portland State University.
Yoko Honda (2013) M.A.
International StudentLife Advis or. M.A. 2010 Portland State University.
Corinne Hughes, (2019) B.A.
Outreach Coordinator, Middle EastStudies Center. M.P.A.
(anticipated 2019), Portland State University
Christine Igarta (2000) M.A.
International Student Advisor. M.A. 2002 Portland State University.
Krista Kennedy (2014)M.S.
Sponsored StudentProgramAdministrator. M.S. 2010
University of Portland.
RachelLanders (2004) B.A.
Education Abroad Advisor. B.A. 2007 Portland State University.

MasumiLint (2011) M.A
ProgramManager, International Special Programs. M.A. 2006 University of Idaho.
Christina Luther (1998) M.A.
Director, International Student \& Scholar Services. M.A.
1993 Portland State University.
Sally Mudiamu (2001) M.A.
Director, International Partnerships and Director, Portland
Center. M.A. 1991 London School of Economics \&
Political Science, University of London.
Eric Skaar (2016) M.S.
International Student Advisor. M.S. 2007 American
University.
Jill Townley (1997) M.S.
Associate Director of International StudentLife. M.S.
2001 Portland State University.
Suwako Watanabe (1990) Ph.D.
Director, Institute for Asian Studies. Ph.D. Georgetown University.
Anri Zama (2014) M.S.
ProgramManager, PortlandCenter. M.S. 2011 Portland State University
Glen Zimmerman (2001) M.A.
Senior Instructor, Portland Center. M.A. 1996 University
of Was hington

## Learning Center

Shoshana Zeisman-Pereyo, Ed.D.
Interim Director, Learning Center, Ed.D. 2012 Portland State University.

## Library

Linda Ueki Absher (2003)M.L.I.S.
Humanities Librarian, Profes sor. M.L.I.S. 1993 University of California, Berkeley.

MichaelS. Bowman (1992) M.Libr.
Interim Dean, Engineering Librarian, Professor. M.Libr.
University of Washington.
Michelle Desilets (2019) M.L.I.S.
Education and Science Librarian, Assis tant Professor.
M.L.I.S. 2000 University of Texas at Austin.

Jill Emery (2011) M.L.I.S.
Collection Development Librarian, Associate Professor. M.L.I.S. 1995 Univers ity ofTexas at Austin.

Emily Ford (2012) M.L.S., M.I.S.
Urban \& Public Affairs Librarian, AssociateProfessor.
M.L.S. 2007 Indiana Univers ity-Bloomington; M.I.S. 2007

Indiana University-Bloomington.
Arthur W. Hendricks (1996) M.S.
Social Sciences Librarian, Profes sor. M.S. 1995 University of Illinois, Urbana-Champaign.

Charles Ed Hill (2019) M.L.S.
Emerging Technologies Librarian and Head of Library

Technology, Senior Instructor 1. M.L.S. 2012 Indiana University, Bloomington.

Elsa Loftis (2018) M.L.I.S.
Humanities and Acquisitions Librarian, Assistant
Professor. M.L.I.S. 2009 The Pratt Institute.
Richard M. Mikulski(2018) Ph.D., M.L.S. Government Documents and Social Sciences Librarian, Assistant Professor. Ph.D. 2014 Univers ity at Buffalo, State Univers ity of New York; M.L.S. 2009 University at Buffalo, State University of New York.

Cristine N. Paschild (2007) M.A., M.S.I.
Univers ity Archivist and Head of Special Collections, Associate Professor. M.A. 1994 University of Michigan, Ann Arbor; M.S.I. 2001 University of Michigan, Ann Arbor.

Kimberly D. Pendell(2010) M.S.I.S.
Social Work and Social Sciences Librarian, As sociate Professor. M.S.I.S. 2005 University of Texas, Austin.

Joan Petit (2009) M.S.L.S.
Humanities and Social Sciences Librarian, As sociate Professor. M.S.L.S. 2006 University of North Carolina, Chapel Hill.

Elizabeth Pickard (2015) M.S.I.
Science and Social Sciences Librarian, Assistant Professor.
M.S.I. 2007 University of Michigan.

Amy Stanforth (2018) M.L.I.S.
Research and Instruction Librarian, Instructor. M.L.I.S. 2009 Emporia State University.
Jian Wang (1999) M.L.I.S.
Electronic and Continuing Resources Librarian, Professor. M.L.I.S. 1996 Wayne State University.

Kimberly Wills on-St. Clair (2011) M.S.
Reference \& Instruction Librarian, Assistant Professor.
M.S. 2001 Univers ity of Illinois, Urbana-Champaign.

Qi Wu (2005) M.L.I.S.
Business Librarian, Associate Professor. M.L.I.S. 2002
University of Illinois, Urbana-Champaign.
Science and SocialSciences Librarian, Assistant Professor.
M.S.I. 2007 University of Michigan.

Robert Schroeder (2004) M.L.I.S.
Education Librarian, Associate Professor. M.L.I.S. 1995
Wayne State University.
Science and Social Sciences Librarian, Assistant Professor. M.S.I. 2007 University of Michigan.

Robert Schroeder (2004) M.L.I.S.
Education Librarian, Associate Professor. M.L.I.S. 1995
Wayne State University.

William Abrams (1962) M.S.L.S.
Principle Serials Cataloger; AssociateProfessor. M.S.L.S. 1961 SyracuseUniversity School of Information Studies.
Daphne T. Allen (1970) M.B.A.
Associate Professor Emerita. M.B.A. 1978 University of California, Los Angeles.

Sarah E. Beas ley (1997) M.A.I.S., M.L.I.S.
Professor Emerita. M.A.I.S. 1996 Oregon State University; M.L.I.S. 1989 Univers ity of Michigan.

Patricia H. Byrd (1961) M.Libr.
Associate Professor Emerita. M.Libr. 1959 University of W ashington.
Sharon Elteto (1997) M.L.S.
Associate Professor Emerita. M.L.S. 1997 Emporia State University.
Donald G. Frank (2000) M.A.L.S.
Professor Emeritus.M.A.L.S. 1982 Texas Tech University.
Claudia V. Irla (2001) M.L.S.
Profes sor Emerita. M.L.S. 1981 University of Maryland.
Mary Ellen Kenreich (1992) M.L.S., M.P.A.
Professor Emerita. M.L.S. 1980 Kent State University; M.P.A. 1999 Portland State University.

Kristen Kern (1998) M.L.S.
Professor Emerita. M.L.S. 1997 Emporia State University.
Thomas Larsen (2003)Ph.D., M.L.S.
Profess or Emeritus. Ph.D. 1988 University of California, Berkeley; M.L.S. 1997 Emporia State University.
Robert W.Lockerby (1967) M.S.
Profes s or Emeritus. M.S. 1979 Portland State University.
Anne G. McMahon (1969) M.L.S.
Associate Professor Emerita. M.L.S. 1965 Pratt Institute.
Gwen E. Newborg (1969) M.A.
Profes s or Emerita. M.A. 1977 Univers ity of W ashington.
Oren O. Ogle (1969) M.Libr.
Associate Professor Emeritus. M.Libr. 1969 University of W ashington.
C. Thomas Pfingsten(1980) M.L.S.

Univers ity Librarian Emeritus. M.L.S. 1966 University of California, Berkeley.
Faye Powell(1985) M.A.
Professor Emerita. M.A. 1982 San Francisco State University.
Terry Rohe (1983) M.L.S.
Profess or Emerita. M.L.S. 1972 University of Oregon.
Gary S. Sampson (1972) M.L.S.
Profess or Emeritus. M.L.S. 1972 University ofCalifornia, Berkeley.

## Emeriti Faculty

Robert Schroeder (2004) M.L.I.S.
Professor Emeritus. M.L.I.S. 1995 Wayne State
University.
Helen H. Spalding (2005) M.A., M.P.A.
Profess or Emerita. M.A. 1974 University ofIowa, M.P.A. 1985 Univers ity of Mis souri-Kansas City.

W endy A. Stewart (1998) M.L.S.
Professor Emeritus. M.L.S. 1995 SyracuseUniversity.
Rosalind C. Wang (1985) M.S.L.S.
Professor Emerita. M.A. 1976 Long Island University.
Robert C. Westover(1971) M.L.S.
Professor Emeritus.M.L.S. 1971 University ofOregon.
William B. Wilson Jr. (1976) M.L.S.
Associate Professor Emeritus. M.L.S. 1970 University of Western Ontario (Canada).
Office of the Registrar
Cynthia H. Baccar (1999) M.S.
Associate Vice Provost \& University Registrar. M.S. 1994
University ofTennessee.
Nicolle DuPont (2001) M.S.
Associate Registrar, Registration \& Records M.S. 2010
Portland State University.
AdamLutzow (2007) B.A.
Assistant Registrar, Academic Scheduling. B.A. 2001
University of Oregon.
Nicholas Matlick(2003) M.A.
Assistant Registrar, Degree Requirements. M.A. 2016
Portland State University.
Luke Norman (2014) M.S.
Assistant Registrar, Regis tration and Records. M.S. 2019
Portland State University.
Kathy Thomas (2002) B.S.
Assistant Registrar, Degree Progress Technology. B.S.
2008 Portland State University.

## Office of Student Affairs

Michele Toppe (1995) Ed.D.
Vice Provost for Student Affairs. Ed.D. 2017 University of Pennsylvania.

Jess Goodwin (1995) B.S.
Systems Analyst, Manager. B.S. 2003 Portland State University.

Tiah Marston (2003) M.Ed.
SeniorFis calOfficer for Student Affairs. M.Ed. 2019
Portland State University.
Alex Miller (2019) M.Ed.
Executive Assistant to the Vice Provost for Student

Affairs. M.Ed. 2011 University of Georgia.
David Woodsum(2008) B.A.
Accountant. B.A. 2008 Portland StateUniversity.

## Center for Student Health and Counseling

Dana Tasson(1998)M.D.
Associate Vice Provost for Student Health \& Well-Being;
Psychiatrist. M.D. 1993 University of Michigan.
Rebecca Aronson (2019) B.A.
MedicalReceptionist. B.A. 2019 University ofTexas, San Antonio.

MarkBajorek (1996) M.D.
Director, Health Services;Physician. M.D. 1986 Ohio State University.

Malia Band (2018) M.P.H.
Director, Dental Services;Regis tered Dental Hygienist.
M.P.H. 2014 Portland State University.

Nellie Bass (2018) B.S.
Reg istered Dental Hygienist. B.S. 2007 Oregon State University.

Erica Bowen (2018)
MedicalReceptionist.
Mary Beth Buffum(2017) B.S.
Patient Care Coordinator. B.S. 1980 University of Oregon.
Amy Collins (2015) M.A.T.
Sexual and Relationship Violence Prevention Coordinator.
M.A.T. 2009 Willamette University.

Keith Conant (2003) M.D.
Psychiatrist. M.D. 2001 Oregon Health and Science
University.
Jennifer Dahlin (2003) Psy.D.
Psychologist. Psy.D. 2004 Pacific University.
Kerynn Davis (2013)B.A.
Front Office Manager. B.A. 2011 Idaho State University.
BreAnna Elkins (2015) B.S.
MedicalReceptionist. B.S. 2016 Portland State University.
CherylForster(2004) Psy.D.
Psychologist, Coordinator of Diversity and Psychology
Programs.Psy.D. 2004 Pacific University.
Hannah Fuson (2020) B.S.
MedicalAssistant. B.S. 2020 Portland State University.
Tara Gardner-Brown (2012) M.S.N.
Ass istant Director, Health Services; Family Nurse

Practitioner. M.S.N. 2001 Washington State University.
Dona George (2015)
Office Specialist 2.
Chandra Gilder (2007) B.A.
Assistant Director, Clinical Operations. B.A. 2006
University of Nevada, Reno.
Heather Goah (2006) M.A.
Director, Adminis trative Services. M.A. 2008 Portland State University.

Katie Greenwood (2008)
Accounts Payable Specialist.
Laura Gurley (2009)
Registered Nurse 2.
Tim Hagge (1992) M.S.W.
Clinical Social Worker. M.S.W. 1992 Portland State
University.
Chris Hanel(2001) M.D.
Physician. M.D. 1997 Oregon Health and Science
University.
Britney Heupel(2012)
MedicalAssistant.
Marcy Hunt (2010) Ph.D.
Director, Counseling Services; Psychologist. Ph.D. 2002
University of Oregon.
Todd Hutchinson(2003)
Software Systems Analyst.
Kyle Isaacs on (2015) Ph.D.
Psychologist, Assessment Coordinator. Ph.D. 2014 Fuller Theological Seminary.

Megan Kasper (2013) B.A.S.
Assistant Director, As sessment and Business Operations.
B.A.S. 2011 Northern Arizona University.

Lisa Koralewicz(2006) M.P.H.; M.S.W .
Clinical Social Worker. M.P.H. 1997 SUNY at Albany;
M.S.W. 2003 Colorado State University.

Jaclyn Krowen (2006)
Registered Nurse.
Kathy Lawrence (2019) M.S.W.
Clinical Social Worker. M.S.W. 2004 Portland State
University.
Karen Ledbetter(1997) Psy.D.
Psychologist, Assessment Coordinator. Psy.D. 1997

Rosemead School of Psychology.
Susan Martindale (2013)
Health Information Coordinator.
Suzanne Meckel(2018)
Dental Assistant.
Natalie Mitchell(2017) Psy.D.
Clinical Director, Counseling Services; Psychologist.
Psy.D. 2008 Illinois School of Professional Psychology at Argosy University.

Ian Phillips (2007)
MedicalAssistant.
Heather Poehler(2009) M.S.
Physician Assistant. M.S. 1993 Duke University.
Keith Powrie (2018) M.S.W.
Clinical Social Worker. M.S.W. 2016 Portland State
University.
Amanda Ramirez (2018) Ph.D.
Psychologist, Diversity \& Inclusion Specialist/Outreach
Coordinator. Ph.D. 2017 University of Rhode Island,
Kingston.
Amy Ruff (2019) M.S.W.
MentalHealth Promotion Coordinator. M.S.W. 2011
University of Pennsylvania.
Kathy Samsom(1999)
RN2 Laboratory, Vaccine, \& X-Ray Coordinator.
Noelle Savatta (2008) Ph.D.
Psychologist.Ph.D. 2007 University of Georgia.
TaylorSchwab (2017) M.P.H.
W ell-Being and Health Promotion Coordinator. M.P.H.
2015 East Carolina University.
Tenaya Stine (2017) M.B.A.
Marketing and Communications Coordinator. M.B.A. 2018
George Fox University.
Gabrielle Sysyn (2008) B.A.
Executive Administrative Coordinator. B.A. 2007 Portland State University.

Tuan Truong (2005) D.M.D.
Dentist. D.M.D. 2004 Oregon Health and Science University.

Tiffany Tyler (2011)
Lead Dental Assistant.

Pamela Vernon (2017) B.S.

Registered Nurse. B.S. 2012 Linfield College.
Joni Walter (2016) A.A.S.
Accounts Receivable Billing Specialist. A.A.S. 2013 Mt.
Hood Community College.
Laura Wasserman (2019) M.S.N.
Nurse Practitioner. M.S.N. 2016 University of North
Carolina, Chapel Hill.
Julie W eissbuch Allina (2013) M.S.W.
Director, Health Promotion and Education. M.S.W. 2001
Saint Louis University.
Jessie Weisstein (2018) M.S.W .
Clinical Social Worker. M.S.W. 2010 Smith College
School for Social W ork.
Alan Yeo (2004) M.D.
Psychiatrist. M.D. 2000 Oreg on Health and Science
University.
ChristiZiegler (2011) B.S.
Insurance Coordinator, Student Health Insurance Program. B.S. 1993 Blooms burg University.

Megan Zimmerer-Mazza (2010) B.S.
Reg istered Nurse. B.S. 2004 Univers ity ofOregon.

## Office of the Dean of Student Life

Michael Walsh(2013) Ed.D.
Associate Vice Provost and Dean ofStudent Life.Ed.D. 2013 Portland State University.

Justin Barrieault (2017) B.A.
SNAP E\&T Case Manager. B.A. 2014 Univers ity of Portland.

Erica Geller (2015) M.S.
StudentConduct Investigator. M.S. 2018 Portland State University.

Jazzmyn Hunsaker(2019) M.S.
Administrative Program Assistant. M.S. 2020 Portland State University.

Liv Parks (2021) M.S.
CARE Team Case Manager. M.S. 2015 Missouri State University.

Joe Soto (2020) M.S.
StudentSuccess Advocate. M.S. 2021 Portland State University.

## Housing and Residence Life

Courtney Shiroma (2010) M.Ed.
Executive Director of Housing and Res idence Life. M.Ed. 2006 Western Carolina University.

Dianne Arce (2014) B.B.A.
Housing Operations Coordinator. B.B.A. 2014 University of Portland.

Sarah Bradley (2019) B.A.
ResidenceDirector. B.A. 2019 Gettysburg College.
Tiffany Daws on (2012)
Housing Occupancy Manager.
Allis on Gammons (2014) M.A.
Hous ing Services Coordinator. M.A. 2013 Bangor
Theological Seminary.
Lindsey Gibson (2020) M.A.
Associate Director for Housing Operations. M.A. 2016
Portland State University.
Morgan Hynson (2020) B.S.
Information Technology Consultant. B.S. 2015 Portland State University.

Russell Jones (2011) M.S.
Interim Ass ociate Director or Residence Life. M.S. 2014 Portland State University.

Joey Koehn(2018) M.S.
Residence Director. M.S. 2020 Portland State University.
Nikki Ludd (2018) M.Ed.
Assistant Director for Summer Hous ing and Conferences. M.Ed. 2015 Univers ity of North Florida.

Angelica Padilla (2021) M.S.
Residence Director. M.S. 2020 University of North
Florida.

Quinn Peoples (2021) M.A.
Residence Director. M.A. 2020 Saint Louis University.
Kade Peden (2017) M.S.
Res idenceDirector. M.S. 2019 Portland State University.
Savannah Swartz(2014) M.S.
ResidenceDirector. M.S. 2020 Portland State University.
Roberto Valentin (2019) M.A.
Assistant Director of Housing and ResidenceLife. M.A.
2016 University of Connecticut.
Karyn Warner(2018) A.A.
Accounts Coordinator, Housing and Residence Life. A.A.
2017 Linfield College.

## Queer Resource Center

K Keith (2013) M.A.; M.S.W .
Director, Queer Resource Center. M.A. 2016 Portland

State University; M.S.W. 2020 Portland State University.
Hollis Kinner(2018) M.S.W.
Coordinator, Queer Students of Color Resources and Retention. M.S.W. 2020 Portland State University.

Jessica Mena(2019) B.S.
Assistant Director, Queer Res ource Center. B.S. 2009
University of Arizona.
Grace Piper (2013) B.A.
Office Manager, Queer Resource Center. B.A. 2017
Portland State University.

## Services for Students with Children

Ida Lombardozzi (2020) M.S.W .
Director, Services for Students with Children.M.S.W.
2012 Portland State University.
MarisolBarce (2014) M.Ed.
Director, Little Vikings. M.Ed. 2020 Portland State University.

Pamela Bock (2015) B.A.
Assistant Director, Services for Students with Children. B.A. 1996 Connecticut College.

Melissa Gorgon Clark (2018) B.A.
Office Manager, Services for Students with Children. B.A. 2018 Portland State University.

Kacy Gardner (2019) A.S.
Director, Baby Vikings. A.S. 2017 Portland Community College.

NatashaMason (2018) A.A.
Office Specialist, Little and Baby Vikings.A.A. 2017
Merced College.
Laura $\operatorname{Ng}$ (2018) B.A.
Jim Sells Childcare Subsidy Coordinator/Accountant. B.A. 2016 Portland State University.

## Student Activities and Leadership Programs

Aimee Shattuck (2000) M.S.W .
Assistant Dean of StudentLife and Director of Student Activities and Leadership Programs. M.S.W. 2002
Portland State University.
Janette Clay (2019) M.S.
Advisor, Student Activities and Leadership Programs.
M.S. 2016 Portland State University.

Maria Dominguez(2019) B.B.A.
Accounting Technician, Student Activities and Leadership
Programs. B.B.A. 2016 University of Phoenix.

Serena Dressel(2015) B.S.
Interim Coordinator, Student Sustainability Center. B.S. 2018 Portland State University.

Onnie Granados (2001)
Information Technology Consultant.
Angela Hamilton (2010) M.A.
Coordinator, Student-Operated Services. M.A. 2011
Portland State University.
Brian Janssen (2014) Ph.D.
Director, Student Organization Advising. Ph.D. 2012 Ohio State University.

Reaz Mahmood (2013) M.A.
Coordinator, Student Media. M.A. 2005 University of North Carolina, ChapelHill.

Emily Melgoza (2016) M.A.
Advis or, Student Activities and Leadership Programs.
M.A. 2019 Portland State University.

Corrine Nightingale (2017) B.A.
Technology Advis or, Student Media. B.A. 2015
W ashington State University, Vancouver.
Rebecca Rodas (2018) M.A.
Advis or, Student Activities and Leadership Programs.
M.A. 2020 Portland State University.

Melia Tichenor(2015) M.S.
Coordinator, Student Community Engagement Center.
M.S. 2017 Portland State University.

Marcos Villanueva (2019)M.Ed.
Advis or, Student Activities and Leadership Programs.
M.Ed. 2016 Univers ity of Southern California.

## Women's Res ource Center

Erica Bestpitch (2012) M.S.
Director, Women's ResourceCenter. M.S. 2012 Portland State University.

Sydney Bernkopf(2016)B.A.
Confidential Advocate. B.A. 2017 Portland State University.

Alisha Howard (2017) B.A.
Sexual and Relationship Violence Response Program Coordinator. B.A. 2006 Fisk University.

Cory Lira (2019) M.Ed.
Assistant Director, Women's ResourceCenter. M.Ed. 2011
University of Oregon.

## Enrollment Management

ChuckKnepfle (2019) Ph.D.
Vice President for Enrollment Management. Ph.D. 2018
Clemson University.
Amanda Bierbrauer (2009) J.D.
Associate Vice Pres ident for Enrollment Management \&
Finance and Administration. J.D. 2020 Lewis \& Clark Law
School.
David Fasolino (2006)
SeniorFiscal Officer. B.A. 2006 Portland State University.
Gabrielle Orfield (2016) MPP
Strategic Data Manager. MPP. 2015 Georgetown
University.
Undergraduate Admissions and New Student Programs
Samuel Dunlop (2013) M.A.
Director of Global Recruitment and Admis sions. M.A. 2013 Portland State University.

Emily Offerdahl(2016) M.A.
Director of Marketing and Communications. M.A. 2014
American University.

Christopher Skinner (2011) M.A.
Director of Admissions Operations. M.A. 1995 Univers ity of California--Santa Barbara.

Eki Yandall (2017) M.Ed.
Director of Undergraduate Admissions. M.Ed. 2014
Willamette University.
Bill Ryder (1999) M.S.
Associate Director of Marketing and Communications.
M.S. 1996 State University of New York College--Buffalo.

Cree Dueker (2016) B.A.
Assistant Director. B.A. 2016 Portland StateUniversity
Dave Kobzina (2005) M.S.
Assistant Director for Trans fer Recruitment. M.S. 2006
Portland State University.
Matthew Peipert (2018) M.A.
Assistant Director for International Recruitment \&
Outreach.M.A. 2014 Les ley University.
Kanani Porotesano (2006) M.S.
Assistant Director, Campus Visits and Events. M.S. 2009
Portland State University.
Tania Sanchez(2013), B.A.
Assistant Director of Multicultural Recruitment. B.A. 2012
Portland State University.
Blythe Urutia (2008) J.D.

Assistant Director of International Evaluation \& Admissions. J.D. 2007 W illamette University.

Student Financial Aid and Scholarships
Elijah Herr (2020) M.Sc.
DirectorofFinancialAid. M.Sc. 2011 London School of Economics.
Shelly Sass (2009) M.P.A.
Associate Director. M.P.A. 2016Portland State University. Maureen Morgan (2021) B.A.
Assistant Director, Loans and Scholarships. B.A. 2004
Drake University.

## Finance and Administration

Kevin Reynolds (2005) Ph.D.
Vice President for Finance and Administration. Ph.D. 1987
University of Southampton.
Don Fors ythe (1999) M.S.Ec.
Treasurer and University DebtManager. M.S.Ec. 2005
Portland State University.
Brian Roy (2013) J.D.
University Risk Manager. J.D. 2002 Louisiana State
University.
Susan Klees (2010) M.S.Ed.
Special Assistant to the Vice Presidentfor Finance and Administration, Senior FiscalOfficer. M.S.Ed. 2012 Portland State University.
Campus Public Safety
Willie Halliburton (2016).
Chief of Campus Police and Director, Campus Public
Safety Office.

## Campus Recreation

Dana Tasson(1998)M.D.
Interim Director, Campus Recreation; Psychiatrist. M.D. 1993 University of Michigan.
Todd Bauch (2003) M.A.
Associate Director of Operations. M.A. 1998 Southern
Illinois University.
Atsu Nagayama (2002) B.A.
Associate Director of Bus iness Services. B.A. 1994
Northwestern University.
Jennifer Welnick (2005) M.S.
Associate Director of Programs. M.S. 2005 Portland State
University.

## Human Resources

Nathan Klinkhammer (2020) M.M.
Associate Vice Pres ident, Human Res ources. Masters Management 2007 Rens sellaer Polytechnic Institute.
Planning, Construction, and Real Estate
Jas on Franklin (2012) M.U.R.P.
Interim Associate Vice Pres ident, Director of Planning Construction and RealEstate. M.U.R.P 1997 Portland State University.

Jenny McNamara (2011)B.A.

Campus Sustainability Manager. Human Ecology \& Sustainable Systems. B.A. 2003 Univers ity of North Carolina Greens boro.

Heather Randol(2010) M.A.
Director of Facilities and Property Management. M.A. 1995 Western W ashington University.

Ian Stude (2004)
Director of Transportation \& Parking Services.
Erin Inskeep (2011) M.B.A.
Chief Finance and Budgetary Officer for Planning, Construction \& Real Estate. M.B.A. 2011 Portland State University.

ChristopherC. Augeri(2016) M.S.
Director, Campus Events \& Student Union. M.S. 2012 Simmons College.

## Student Financial Services

Amanda Bierbrauer (2009) M.B.A., J.D.
Associate Vice Pres ident of Enrollment Management \& StudentFInances. M.B.A. 2008 Marylhurst University. J.D. 2020 Lewis \& Clark Law School.

## University Budget Office

Andria Johnson (2010) M.S.F.A .
Associate Vice President, University Budget \& Financial Planning. M.S.F.A. 2013 Portland State University.

## University Financial Services

Jason Abbot (2011) M.S.
Controller. MS 2006 James Madis on University.

## University Risk Management

Brian Roy (2013) J.D.
Associate Vice President, Risk and Contracting. J.D. 2002
Louis iana State University.
Don Johansen (2006) B.S.
Assistant Director, Risk Management. B.S. 1974 Portland State University.

Emma Stocker (2016) M.P.A.
Director of Emergency Management. M.P.A. 2014
University of Oregon.
Jeff Rook (2004) M.L.
Director, Environmental Health \& Safety. M.L. University of St. Andres, Scotland, UK.
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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.

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Assistant General Counsel. J.D. 2003 Lewis \& Clark Law School.

Jeremy S. Healey (2019) J.D.
Assistant GeneralCounsel, J.D. 2008 Univers ity ofOregon School of Law.

Krista S. Stearns (2014) J.D.
Assistant GeneralCounsel. J.D. 1992 University of
Minnesota Law School.

## Global Diversity and Inclusion

Ame Lambert (2020) Ph.D.
Vice President for Global Divers ity \& Inclusion. Ph.D.
1997 Univers ity ofTexas at Tyler.
Julie Caron (2011) J.D.
Associate Vice Pres ident 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, Univers ity Studies \& Public Administration. M.S. 2001
Portland State University.
Linda L. Liu (2008) M.A.
ProgramDirector, TRiO - Student Support 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.

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Director and Managing Attorney - Student Legal Services.
JD. 1972 University of Oregon Schoolof Law.

## Office of Information Technology

Kirk Kelly (2011) M.S.
Vice President for Information Technology and CIO. M.S. - M.I.S. 2006 Univers ity 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, A cademic \& Technology Services. M.S. 2015 Portland State University.
Michele W ebber (2016) B.S.
Finance and Operations Associate Director. B.S. 1990 Cal State University DominguezHills.

## 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.

Michael Smith (2017) M.S.
Senior Institutional Research Analyst, Institutional Research and Planning. M.S. 2017 MarshallUniversity.

Zach Markiss (2013)M.S.
Research Analyst, Institutional Research and Planning. M.S. 2009 Univers ity ofIdaho.

Paul Skoms vold (2018) M.A.
Research Assistant Analyst, Instructional Research and Planning. M.A. 2018 Univers ity of California, Davis.

## Research \& Graduate Studies

Brandon Barnhill (2015) B.S.
Compliance Officer-HIPPA \& Export Controls, Research Integrity. B.S. 2010 Eastern OregonUniversity.

Dawn Boatman (2008) M.P.A.
Assistant Vice President of Research Administration.
M.P.A. 1994 University of NorthFlorida.

Kelly Clifton (2010) Ph.D.
Interim Associate Vice Pres ident 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.
Shaun McGillis (2011) M.F.A.
Communications and Programs Manager, Research
Development. M.F.A. 2011 Portland State University.
Jas on Podrabsky (2003) Ph.D.
Interim Vice President forResearch \& Graduate Studies. Ph.D. 1999 University ofColorado at Boulder.

Margaret Rea (2015) M.B.A.
Senior Fiscal Officer for Research \& Graduate Studies. M.B.A. 2020 Portland State University.

Shannon Roth (2014) E.M.P.A.
Director of Research Integrity \& Compliance Operations. E.M.P.A. 2017 Portland State University.

Amy Spring (2000) M.P.A.
Director of Project Management and Communications, Research Development. M.P.A. 1997 Portland State University.

Jennifer Ward (2012) B.A.
Director of Spons ored Projects Operations. B.A. 2003
University of Colorado at Boulder.
Trav is W oodland (2018) M.S.
Director of Innovation \& Intellectual Property. M.S. 2011
University of Idaho.

## The Graduate School

Rossitza B. Wooster (2002) Ph.D.
Dean of the Graduate School; Professor of Economics.
Ph.D. 2002 University of Oregon.
MarkWoods (2008) Ph.D.
Associate Dean of the Graduate School; Associate
Profes sor of Chemistry. Ph.D. 1998 University ofDurham, England.

Jim Bauer (2013) B.S.
Data Systems Manager. B.S. 2012 Portland State
University.
Mary Breaden (2018) M.A.
Associate Director of Admis sions, Communications and
Marketing. M.A. 2013 Portland State University
Kelly Doherty (2007) M.P.A.
Directorof Graduate Admis sions. M.P.A. 2010 Portland State University.

Courtney Ann Hanson (2005) M.S.
Director of Graduate Academic Services. M.S. 2012
Portland State University.
Beth Holmes (2008) B.A.
Graduate DARS Coordinator. B.A. 2005 Portland State University.

Edward Lentz (2010). M.S.
Graduate Admis sions Coordinator. M.S. 2016 Portland State University

Roxanne Treece (2011) B.A.

Assistant Director of Graduate Academic Services. B.A. 2004 Arizona 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 Interdis ciplinary Mentoring Research Thomas Keller (2006) Ph.D.
Director. Ph.D. 2000 University of Washington.
Kay Logan (2010) M.S.
CenterCoordinator. M.S. 1989 University of California San Francisco.

## Digital City Tes tbed Center

Molly Baer Kramer (2017) Ph.D.
Project Manager. Ph.D. 2018 University of Oxford.
FletcherBeaudoin (2009) M.P.A.
Advis or. M.P.A. 2009 Columbia University.
Jonathan Fink (2010) Ph.D.
Director. Ph.D. 1979 Stanford University.
Tania Hoode (2012)B.A.
ProgramAssistant. B.A. 1997 The Evergreen State College.
Homeless ness Research and Action Collaborative Jacen Greene (2011) M.B.A.
Assistant Director. M.B.A. 2009 Portland State University. Tania Hoode (2012) B.A.
ProgramAssistant. B.A. 1997 The Evergreen State College.
Stefanie Knowlton (2019) B.A.
Communications Specialist. B.A. 2000 University of Oregon.
Greg Townley (2012) Ph.D.
Director of Research.Ph.D. 2012 University of South
Carolina.
Marisa Zapata (2013) Ph.D.
CenterDirector. Ph.D. 2009 University of Illino is UrbanaChampaign.

## Institute for Sustainable Solutions

Molly Baer Kramer (2017) Ph.D.
Project Manager. Ph.D. 2018 University of Oxford.
Fletcher Beaudoin (2009) M.P.A.
Director. M.P.A. 2009 Columbia University.
Beth Elaine Gilden (2017) M.S.
Project Manager. M.S. 2015 Portland State University.

Alison Hopcroft (2019) M.A.
Partnership Manager.M.A. 2006Monterey Institute of International Studies.

Elizabeth Lloyd-Pool(2006) B.S.
ProgramManager. B.S. 2001 Portland StateUniversity.

## Transportation Research and Education Center

Jennifer Dill (2001) Ph.D.
Director. Ph.D. 2001 Univers ity of California, Berkeley.
Lacey Friedly (2013) M.A.
Communications Coordinator. M.A. 2013 Portland State University.
Hau Hagedorn(2006) M.P.A.
Associate Director. M.P.A. 2020 Portland State University.
Tammy Lee (2018) Ph.D.
Transportation DataProgramAdminis trator. Ph.D. 2015
W as hington State University.
John MacArthur (2009) M.S.
Sustainable Transportation ProgramManager. M.S. 1995
University of Michigan.
Cait McCusker (2017) B.A.
Communications Director. B.A. 2009 Bentley University. Nathan McNeil(2010) M.U.R.P.
Research Associate. M.U.R.P. 2010 Portland State
University.
Rebecca Bornstein (2021) M.F.A.
Office and Events Coordinator. M.F.A. 2015 North
Carolina State University.
Brendan Williams (2019) B.S.
Research and Grants ProgramAdministrator. B.S. 2001
University of Connecticut.

## University Relations

Kevin Neely (2017) B.S.
Vice President for Univers ity Relations. B.S. 1996
Portland State University.
AlysonKraus (2011) B.A.
Directorof 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 them in accordance with donors' wishes. The PSUFoundation is responsible for raising and managing private resources to support the mission 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; Associate Professor of Music. D.M.A. 2004 University of California Los Angeles.

## School of Architecture

## Faculty

L. Rudolph Barton(1988) M.Arch.

Emeritus Professor 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.
Assistant 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.
Profess or of Architecture. M.Arch. 1990 University of Pennsylvania.

Sergio Palleroni(2008) M.S.Arch.
Professor of Architecture. M.S.Arch. 2006 Mas sachusetts Institute ofTechnology.
Andrew Santa Lucia (2016) M.A.
Assistant Professor of Practice. M.A. 2012 Univers ity of Illinois at Chicago.

Jeff Schnabel(2007) M.Arch.

Director, School of Architecture; Professor of Architecture. M.Arch. 1990 Univers ity of Pennsylvania.

Laila Seewang (2019) Ph.D.
Assistant Professor of Architecture. Ph.D. 2019
Eidgenössische Technische Hochschule Zürich.
Barbara A. Sestak(1982) M.Arch.
Profess or of Architecture. M.Arch. 1977 University of W ashington.
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.
Profes or of Art. M.F.A. 2004 Univers ity of Nebraska.
Horia Boboia (2001) M.F.A.
Profess or of Art. M.F.A. 1985 California Instituteof the Arts.

Lis Charman (2000) M.F.A.
Director, School of Art+Design; ProfessorofArt. M.F.A. 1992 California Institute of the Arts.

EleanorH. Erskine (1995) M.F.A.
Profes sor 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.
Profes s or of Art. M.F.A. 2001 Maryland InstituteCollege of Art.

Alis on Heryer (2013) M.F.A.
Associate Professor of Art. M.F.A. 2010 University 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 W is consin.

Meredith James (2014) M.F.A.
Associate Professor of Art. M.F.A. 2008 Cranbrook Academy of Art.

Lisa Jarrett (2013) M.F.A.
Associate 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 History. 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.
Professor of Art History. Ph.D. 2007 Johns Hopkins University.
Anne McClanan (1999) Ph.D.
Profes s or of Art History. Ph.D. 1997 Harvard Univers ity.
Alberto McKelliganHernández(2017) Ph.D.
Ass istant Professor of Art History. Ph.D. 2017 City
University of New York.
Julie Perini (2011) M.F.A.
Associate Professor of Art. M.F.A. 2006 University at Buffalo.

Ralph Pugay (2016) M.F.A.
Assistant Professor of Art. M.F.A. 2010Portland State University.

Carmen Ripollés (2013) Ph.D.
Associate 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. 2012 Portland State University.

## 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.
Craig G. Cheshire (1964) M.F.A.
Profes sor Emeritus of Art. M.F.A. 1961 Univers ity of Oregon.
Charles Colbert (2000) Ph.D.
Assistant Professor Emeritus of Art History. Ph.D. 1978 Harvard University.

Mary A. Constans (1968) M.S. Profess or Emerita of Art. M.S. 1965 University 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 or Emerita of Art. M.A. 1948 Institute of Design, Illinois Institute of Technology.
James L. Hansen (1964) Cert-Fine Arts

Profess or Emeritus of Art. Cert-Fine Arts 1951 Portland Museum Art School.

Susan J. Harlan (1992) M.F.A.
Profess or Emerita of Art. M.F.A. 1975 University of Miami.

James S. Hibbard (1967) M.A.
Profes 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.

Michihiro Kosuge(1978) M.F.A.
Profes sor Emeritus of Art. M.F.A. 1970 San Francisco Art Institute.

Jane Kristof(1973) Ph.D.
Profess or Emerita of Art History. Ph.D. 1972 Columbia University.

Robert Morton (1963)M.F.A.
Professor Emeritus of Art. M.F.A. 1957 University of W ashington.

DanielPirofsky (1998) B.A.
Assistant Professor Emeritus of Art.B.A. 1989 Naropa Institute.

Rita J. Robillard (1999) M.F.A.
Profes or Emerita of Art. M.F.A. 1981 University of California, Berkeley.
Sue Taylor(1997) Ph.D.
Profes sor 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 .
Profes sor 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.

Joel Bluestone(1989) D.M.A.
Professor of Music (percussion). D.M.A. 1987 State Univers ity of New York, Stony Brook.

Antares Boyle (2019) Ph.D.
Assistant Professor of Music (theory). Ph.D. 2018
University of British Columbia.
Sydney Carls on (2008) D.M.A.
Profes sor of Music (flute). D.M.A. 1996 University of Houston.

Susan Chan (2004)D.M.A.
Profess or of Music (piano). D.M.A. 1994 Indiana
University.
Hamilton Cheifetz (1977)
Profess or of Music (cello).
George Colligan (2011) M.A.
Associate Professor of Music (jazz). M.A. 2007 Queens College.

Tomas Cotik(2016) D.M.A.
Associate 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 Univers ity of Colorado-Boulder.

Darrell Grant (1997) M.M.
Profess or of Music (jazz). M.M. 1986 University of Miami.

Barbara Heilmair (2007) D.M.A.
Associate Professor of Music (clarinet, music history). 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
Univers ity of Mis souri-Kansas City.
Karin Magaldi(1999) M.F.A.
Associate Director, Theater; Professor of Theater Arts (playwriting). 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 Mus ic \& Theater; Professor of Music (composition). D.M.A. 1998 Univers ity of Cincinnati.

Caroline Miller (2021) Ph.D.
Assistant Professor of Music (technology). Ph.D. 2019
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Jelena Schiff(2015) D.M.A.
Assistant Professor of Music (musicology). D.M.A. 2012 Boston University.
Ken Selden (2006) D.M.A.

Professor of Music (orchestra). D.M.A. 2005 Peabody Conservatory.

Ethan Sperry (2010) D.M.A.
Professor of Music (choirs). D.M.A. 2000 University of Southern California.

Karen L. Strand (1989) M.M.
Associate Professor ofMusic (oboe). M.M. 1982 Eastman SchoolofMusic.

Pat Vandehey (2017) M.S.
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M.S. 1988 Portland State University.

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Matthew F. Gebhardt (2012) Ph.D.
Associate Professor of Urban Studies and Planning. Ph.D. 2009 Columbia University.
Aaron Golub (2015) Ph.D.
Associate Professor of Urban Studies and
Planning; Director, Nohad A. Toulan School of Urban Studies and Planning.
Ph.D. 2003 University ofCalifornia, Berkeley.
Megan Horst (2015) Ph.D.
Associate Professor of Urban Studies and Planning. Ph.D. 2015 University of W ashington.
Jenny Hs ing-I Liu (2012) Ph.D.

Associate Professor of Urban Studies and Planning. Ph.D. 2010 University of California, Berkeley.

Julius McGee (2016) Ph.D.
Assistant Professor of Urban Studies and Planning and Black Studies. Ph.D. 2016 Univers ity of Oregon.

Kacy McKinney (2019) Ph.D.
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University of Washington.
Moriah McSharry McGrath (2017) Ph.D.
Senior Instructor of Urban Studies and Planning. Ph.D.
2013 Portland State University.
Connie Ozawa (1994) Ph.D.
Professor of Urban Studies and Planning. Ph.D. 1988
Mas sachusetts Institute of Technology.
Gregory R. Schrock (2010) Ph.D.
Associate Professor of Urban Studies and Planning. Ph.D. 2010 University ofIllinois at Chicago.

Vivek Shandas (2005) Ph.D.
Profes sor of Urban Studies and Planning. Ph.D. 2005
University of Washington.
Gerald Sussman (1995) Ph.D.
Profes sor of Urban Studies and Planning and International and GlobalStudies. Ph.D. 1983 University of Hawaii.

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Associate Professor of Urban Studies and Planning. Ph.D. 2009 University of W ashington, Seattle.
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## Emeriti Faculty

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Professor Emeritus of Urban Studies and Planning. Ph.D. 1971 University ofChicago.
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Loren Lutzenhiser (2002) Ph.D.
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PaulL. Niebanck(1993) Ph.D.
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Professor Emeritus of Urban Studies and Planning. Ph.D. 1975 University ofCalifornia, Los Angeles.

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James G. Strathman (1982) Ph.D.
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## Department of Political Science

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## Emeriti Faculty

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## Department of Public Administration

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University of Southern California.

## Courses

## Course numbering system.

Courses are numbered as follows:
0 - 99 Noncredit courses or credit courses of a remedial, terminal, or semiprofessional nature not applicable toward degree requirements.
100-299 Courses onthe lower-division level.
300 - 499 Courses on the upper-division level.
$4 \mathrm{xx} / 5 \mathrm{xx}$ Master's level graduate courses which are also offered as courses forundergraduates.

5 xx 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.
$5 \mathrm{xx} / 6 \mathrm{xx}$ 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 ins tructional 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 system is generally in effect in all Oregon public institutions: 100 to 110

## 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 includeuse of Taccounts, rules of Debits/Credits, journal entries, adjusting and closing entries, and subsequent preparation of financial statements. Prerequisite: BA 211..
and 200 to 210 courses are survey or foundation courses in the liberal arts and sciences in the dis ciplines covered.
The following numbered courses are repeating courses (they may be taken for more than one term under 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 Thesis/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-level counterparts. 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 310-Professional AccountingSeminar (2)

This course is designed to introduce students to a wide range of accounting careers. Guest speakers from public accounting firms, private industry and governmental agencies will provide information and discuss various career paths 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: B or better in both BA 211 or consent of instructor..

## Actg 335 -Accounting Information Systems and Analytic Fundamentals (4)

Methodology used in information systems to: 1) collect, store, andextract accounting data; and2) 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 ofthe 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 (4)

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 Stat243..
Actg $\mathbf{3 8 1}$ - Financial Accounting and Reporting I (4)

Comprehensive study of the principles, conventions and postulates of financial accounting. Appropriate preparation of GAAP financial statements and financial dis closures, 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 theresponsibility of accountants for maintaining professional accountability to the public interest in the face of institutional pressures. This is the first course in a sequence of three: $\operatorname{Actg} 381, \operatorname{Actg} 382$, and $\operatorname{Actg} 383$ which must be taken in sequence.
Prerequisite: BA 213, Ec 202, Stat 241 or Stat $243 \ldots$
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 theresponsibility of accountants for maintaining professional accountability to the public interest in the face of institutional pressures. This is the second course in a
sequence ofthree: $\operatorname{Actg} 381, \operatorname{Actg} 382$, 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 ofGAAP financial statements and financial dis closures, 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 theresponsibility 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 managementto be studied by the individual and dis cussed in group meeting under direction of academic staff.

## Actg 409-Practicum(1-8)

(Credit to be arranged.)

## Actg 410 -SelectedTopics (1-6)

(Credit to be arranged.)

## Actg 421 - Taxation (4)

Provides students with a broad range of taxconcepts, tax policies, and different types of taxpayers.
Students should develop an understanding of how tax laws affect most business and personal financial decisions. Taxreporting, taxplanning, and basic tax research skills will be emphas ized.

Prerequisite: Actg 381.

## Actg 422 - Advanced Taxation (4)

Expands students' knowledge of how tax laws affect sole proprietors, partnerships, corporations, and other businessentities. In addition, the taxlaws applicable to es tates, gifts, trusts, taxexempt organizations, and foreign persons are explored.
Also offered for graduate-level credit as Actg 522 and Actg 522S and may be taken only once for credit.. Prerequis ite: 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 governmental entities 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 operationalenvironments are different from businesses, andhow accounting and financial 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 forlitigation and mediation, how to testify in various trials, and how to conduct and write up a fraud investigation.
Also offered for graduate-levelcredit 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 offinancial and non-financial 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 once for 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 attributeand variables sampling as wellas the effects of computers and computer-control procedures on the audit process are examined. In addition, audit, compilation, and review reports are important elements 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 Iss ues (4)

Integrates topics fromvarious accounting areas. Provides students with opportunities to see the accounting interactions and tradeoffs that result from realistic bus iness situations. Course will enhance students' understanding of accounting and its influence on business, as well as the understanding of
how bus iness 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 business operation 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 business operation 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 emphas is is placed on understanding the financial reports that are the end product of this system-what they do and do not tell
the user about a business enterprise. The accounting principles, conventions, and concepts underlying financial reporting are examined with the objective of developing the ability to read, comprehend, and performa basic analysis of financialstatements. An introduction to environmentperformance reporting also will be provided. Ethics are es sential 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' knowledge of how tax laws affect sole proprietors, partnerships, corporations, and other businessentities. In addition, the taxlaws applicable to estates, gifts, trusts, taxexempt organizations, and foreign pers ons 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 for credit.

## Actg 522S - Advanced Taxation (4)

Expands students' knowledge of how tax laws affect sole proprietors, partnerships, corporations, and other businessentities. In addition, the taxlaws applicable to estates, gifts, trusts, tax exempt organizations, and foreign pers ons 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 522 and may be taken only once for credit..

## Actg 525 - Tax Res earch Documentation and Procedure (4)

Methods of researching tax rulings and laws in tax accounting; study of the adminis tration and responsibilities of taxpractice.

## Actg 526 - Accounting Methods and Periods (4)

Deals with federal income tax is sues that arise with respect to the determination of the proper periods for reporting income and deductions, overall methods of tax accounting and allof the choices and options available to taxpayers.

## Actg 527 - Corporate Taxation I (4)

Introduction to the taxlaws relating to corporations and their owners. The purpose of the course is develop an understanding of the federalincome tax rules 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 fromsales, exchanges, and other dispositions of property, determining the taxable event; ascertaining basis and amount realized; 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 as sociated with the formation, operation, and dis solution 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; passthrough of corporate net operating loss; distributions of previously taxed income; and specialtaxes 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 dispositions 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 is sues and taxation other than federal income tax, including property taxprocesses, sales and use taxes, multis tate 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 bus iness within the United States.

Prerequisite: Actg 527..

## Actg 537 - Tax Accounting Capstone Consulting Project (4)

This capstonecourse provides students with an opportunity to work on real business problems for companies. MTaxstudents work as a 3-4 person consulting team with a client and Faculty Advisor to develop solutions that will be put to use by the client.

Prerequisite:Final term of program.

## Actg 539 - Trust, Estate \& Gift Taxation (4)

This course consists of a detailed review of the federal estate tax, gift tax and generation-skipping tax laws. In the area of es tate taxation, assets included, credits permitted and deductions allowed are reviewed in detail by reference to law, regulations and cases.

## Actg 540 -Practicum/ Internship (4)

The Accounting Practicum is 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 term of program.

## Actg 542 - Tax Factors in Business Decisions (4)

Tax implications of common business questions and transactions, including choices ofbusiness entity, acquisition and sale of business assets, compensation and benefits planning, and U.S. taxation of internationaltrade. Students will be exposed to the common income and estate taxplanning strategies of individuals and families engaged in business.

Prerequisite: Actg 512 or admission 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 fraud environment, fraud schemes, fraud prevention and detection controls, fraudster characteristics, interview and evidence techniques, the legalsystemand 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. . CrossListed as: This is the same course as Actg 545 S 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 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 undergraduate-level credit as Actg 445 and may be taken only once for credit. . CrossListed 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 trans actions. Contemporary is sues are examined in the context of factors that shape accounting standards and current trends in financialreporting.

Prerequis ite: 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 is sues. Addresses the information systems is sues encountered by internal financial analysts. Topics may include database and accounting information systemdesign, model building, the useof accounting information for forecasting, and other topics
as sociated 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 fromaccounting systems designed to prepare external financial reports 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.

Prerequis ite: Actg 512 or admission to the Master of Science in financial analysis program.

## Actg 553 - Financial Statement Analysis (4)

Sound financial information for making business decisions is obtained by an understanding of accounting data from which the information is derived as well as by the application of tools of analys is. 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 disclosure process, and its use in comparing business performance.

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 practical frameworks to address complexethical and social is sues and explore organizational processes and structures that can shape social performances. 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 cours e will take an adaptable view of topics covered, monitoring recent regulatory is sues to include timely complex is sues that mustbe understood by today's financial accounting professional.

Prerequisite: admission 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, mortgages, 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. . CrossListed as: This is the same course as Actg 585S and may be taken only once forcredit. .

## 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 sales. Covers law part of CPA exam.
Also offered for undergraduate-level credit 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 financialstatements of business and other organizations. Audit standards and objectives and conceptual framework for collection of evidenceand 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. . CrossListed as:This is the same course as Actg 592S and may be taken only once forcredit..
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 evidenceand 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 important elements of this course.
Also offered for undergraduate-level credit 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 important elements of this course.
Also offered for undergraduate-level credit as Actg 493 and may be taken only once for credit. . Prerequisite: Actg 492.. Cross-Listed as: This is the same course as Actg 593 and may be taken only once for credit.
Actg 601 - Research (1-9)
(Credit to be arranged.)

## Actg 607-Seminar (1-9)

(Credit to be arranged.)

## Age - Aging/Gerontology

Age 501 - Res earch (1-6)
(Credit to be arranged.) Consent of Instructor.

Age 502 - Independent Study (1-12)
(Credit to be arranged.)

## Age 504 - Cooperative Education/Internship (115)

(Credit to be arranged.)

## Age 505-Reading and Conference (1-8)

(Credit to be arranged.)

## Age 510 -Selected Topics (1-8)

## (Credit to be arranged.)

## Age 516 - Families and Aging (4)

Family ties ofmiddle 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 healthy 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 mechanis ms in longterm care, 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 - Pers pectives on Aging (3)

An introduction to the field ofgerontology is presented fromthe 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 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 theaged and non-aged; (2) review the economic and policy factors that influencethe 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 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 olderpeople. 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 as signments.

Also offered as Age 660 and may be taken only once for 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 longterm care, both public and private. Thepolicy is sues in current long-termcare initiatives are explored.

Also offered as Age 657 and may be taken only once for credit..

## Age 658 - Pers pectives on Aging (3)

An introduction to the field ofgerontology 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 once for credit..

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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 ofold age income support in the U.S. and abroad; (4) explore the his tory, 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 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 thereadings and course assignments.
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 amonghumans, primates, and our fossil ancestors; the fallacy of the race concept. Bioculturalevolution 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 ofmodern 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 Pers pective (4)

Examination of anthropologicalapproaches to cultural diversity in a global context. Include cultural contactbetween the Fourth World and the industrialized world; health, nutrition, and poverty in different world areas; ecocide and ethnocide; 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, politicaleconomy, and transnational culture flows.

## Anth 304-Social Theory (4)

Examines powerrelations in social organization from the family to the globaleconomy. Topics include political processes, exploitation, identity, agency, social change, and globalization, with an emphasis on understanding contemporary social is sues in crosscultural 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 developmentof the conceptof culture within anthropology. Examines how the culture concept and the theories based on it both challenge and reproduce existing powerrelations. Topics include: structural racism, violence and policing, globalization, inequality, religion, technology. Designed for anthropology majors and minors. Note:This course is not approved for distribution 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, gendershifts, religious and res is tance movements andother trends. Most years will focus on PRCbut 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 thenations 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 colonialistsettler populations, including issues of decolonization, social and cultural change and pers is tence, and shifting governmental policies.

## Anth 314U- Native Americans (4)

Ethnographic survey of past and presentNorth American Indigenous peoples, covering sense of place, negotiations and adjustments to colonialism, his torical trajectories, and contemporary ways oflife.

## 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 involving 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 ofSouth Asia, the area encompassed by India, Pakistan, SriLanka, Nepal, Bangladesh, Butan and the Maldive Is lands. 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 As sians including Chinese, Japanese, Korean, Filipino, Vietnamese, South Asians, and others.

## Anth 319U- Traditional Cultures of Africa (4)

A survey ofthe culturehistory and characteristics 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 Northwest coast of North America include s ome of the most affluent, diverse, and complexpeoples in the world. This course examines the unity and diversity of these cultures from Alaska to the Oregon-California border by tracing their historicalevolution and responses to contemporary problems. Topics include: subsistence economies 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 ofmedical anthropology. Biocultural aspects of dis ease and healing. Comparison of healers and healing professions in Western and non-Western 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. Emphasis 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 res is tance, social change and gender relations.

## Anth 333U- Anthropology of Food (4)

Explores biological and cultural aspects of pastand presenthuman 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 them for 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 340 - 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 res earch methods can benefit design practice. Critically explores the fields of design thinking and humanitarian design as well as efforts to usedesign forsocial justice.

## Anth 345 - Practicing Anthropology (4)

Introduction to applied anthropology as a tool to address realworld problems related to development, environment, human health, cultural res ource management, conflict, and more. Includes creation of a personalized career plan which will assist 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 andanalysis 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 postcolonialism. Includes laboratories in artifact analysis and interpretation. Topics include the archaeology of forts and the fur trade, American immigration, heritage, and public interpretation.

## Anth 357U- Archaeology in Popular Culture (4)

Build knowledge ofscience 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 investigation of the archaeology of Europe, and major events in European prehistory including premodern 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 from the earliest traces until the first written records; it includes human origins (physical and cultural evolution), the earliestcivilization, peopling of Africa, migrations, earliest settlements, origins of agriculture and metallurgy. This is the same course as BSt 362U and may be taken only once for credit.
Cross-Listedas: BSt 362U.

## Anth 363U- Egyptian Archaeology: From Earliest Peoples to the Pyramid Age (4)

A survey ofthe archaeologicalrecord of Egypt beginning with the earliest evidence of chuman occupation to the Pyramid era, with an emphas is on the period from 6000 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 archaeologistevidence over 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 complexand varied approaches to organizing labor, political, and economic systems.

## Anth 365U- The Archaeology of North America (4)

An investigation of majorevents and cultural transitions in the ancient cultures and societies of North America north of Mexico, including major migrations, hunter-gatherer 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 investigation 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 continent of the Pacific Is lands. Explores cultural developments and human ecosystemengineering in island groups such as Guam and the Mariana Is lands, Hawai'i, Rapa Nui/Easter Island, and AotearoaNew Zealand.

## Anth 370 -Paleoanthropology (5)

Ape and human (i.e., hominoid) evolution fromthe Miocene through the Pleis tocene with focus on the fossil record. Emphas is on methods used to reconstruct the past, including integration of knowledge fromgeology and paleoecology; functional and comparative anatomy; phylogenetics; and prehistoric 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. Significanceofgeographic patterns for reconstructing prehistoric dispersals and settlement of the earth, beginning with ourorigins on the African continent. Integration of evolutionary genetics with biogeographic, environmental, fossil, 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 ofliving non-human primates. Primate ecology and behavior are explored froma comparative andevolutionary perspective. Emphas is on primates in natural habitats rather than in captive settings, spanning lemurs, lorises, tarsiers, monkeys and apes. Expected preparation: Anth 101.

## Anth 376U- The Neandertals (4)

Neandertalbiology and behavior; who they were, how they lived, and the nature of interactions between Neandertals and modernhumans. Critical debates over the place of the Neandertals in human evolution. Exploration draws frompaleontological, 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 anthropology and taphonomy, including assessment of age, sex, population-based skeletal variation, andeffects of peri-/post-mortem environmental processes on forensic investigation. Course clarifies popular media mis information with fact-based overview of real forens ic analysis. Expected preparation: Anth 101.

## Anth 399-Special Studies (1-12)

See department for course description. (Credit to be arranged.)

## Anth 399U- Special Studies (4)

Special Studies (Credit to be arranged.)

## Anth 401 - Res earch (1-6)

See department for course description. Consent of instructor. (Credit to be arranged.)

## Anth 404-Cooperative Education/internship(112)

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)

Practicalcoursework and community-based experience in research design and qualitative methodology. Students conceptualize and implement research projects, gather and analyze data, and write a proposal forhypothetical future research. Essential training for basic ethnographic research and applied projects.

Also offered for graduate-level credit as Anth 512 and may be taken only once for credit.. 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 from the 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 independentres earch on a real world problem linked with his/her career goal.
Also offered for graduate-level credit as Anth 515 and may be taken only once for credit. . 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 social relations in cities across the world.

Also offered for graduate-level credit as Anth 516 and may be taken only once for credit. . Prerequis ite: Upper division standing.

## Anth 417-Advanced Topics in Native American Studies (4)

In-depth examination of a current scholarly topic in the anthropology of Native North America, especially in relation to colonialismand Native resistance. Course 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 issues of environmental change, adaptation, conservation and sustainability, biocultural diversity, resilience, political ecology, and environmental justice, 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. . Prerequis ite: 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-togovernment relations, economic development, natural and cultural res ource management, health care, welfare, and education. Both reservation communities and thePortland 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. . Prerequis ite: 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 include but are not limited to pandemics and epidemics, emerg ing illnesses, food systems, new medical technologies, social meanings of the body and illness identities, patientactivism, 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 for credit. . Prerequisite: Upper division standing.

## Anth 426-Transnationalism and Migration (4)

In-depth exploration of globalization, transnationalism, and migration. Topics include colonialismand the history of world connections, the global economic system, cultural imperialism, nationalismand identity, migration, refugees, tourism, and the commodification of local cultures.
Also offered for graduate-level credit as Anth 526 and may be taken only once for credit. . 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. Emphas is on decolonization, political economy, and critical race and feminist theories.

Also offered for graduate-level credit as Anth 528 and may be taken only once for credit. . 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 for credit. . Prerequisite: Upper division standing.

## Anth 431 - Topics in Latin American in Ethnography (4)

In-depth exploration of a currenttopic in Latin American and Caribbean anthropology, especially in relation to power, structural inequality and violence, culturalidentities, social movements, the State, and postcolonial his tories. 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 from around the world. Explores biologicaland social aspects 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 reproductive technologies, 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. . Prerequis ite: Upper division standing.

## Anth 440 -Design Anthropology (4)

Explores the relationship between anthropology and design. Addresses how anthropologists collaborate with des igners 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 useful forstudents interested in human centered approaches to problem solving and for students pursuing a career in designing innovative products or doinguser experience research.
Also offered for graduate-level credit as Anth 540 and may be taken only once for credit.. Prerequisite: Upper division standing.

## Anth 447 - Advanced Topics in Asian Anthropology (4)

In-depth exploration of a current topic in Asian anthropology, especially in relation to social change, nationalismand conflict, colonialism, or modernization. Course materials will cover both theory and ethnography.
Also offered for graduate-level 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, site excavation, sampling and recording techniques, mapping, and cultural resource management.
Also offered for graduate-level credit as Anth 553 and may be taken only once for credit. . Prerequisite: Upper division standing.

## Anth 454 - Archaeological FieldS chool (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: Admission to course is by permis sion of instructor via an application process..

## Anth 455-Analysis of Faunal Remains (5)

Reviews issues of recovery, identification, quantification, and interpretation of archaeological faunal remains. Seminar component involves discussion and critical review of recent faunal studies. Laboratory component introduces student to skeletalanatomy of vertebrates (with focus on fishes and mammals) and bas ic procedures used in faunal analys is.

Also offered for graduate-level credit as Anth 555 and may be taken only once for credit. . Prerequisite: Anth 350.

## Anth 456-Cultural and Heritage Res ources Management (4)

Introduction to the preservation, conservation, and management of cultural and heritageresources in North America, including the legal and regulatory frameworks. Topics include agency and privatesector 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 once for credit.. Prerequisite: Upper divis ion 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-gatherersettlement and mobility strategies, social complexity among hunter-gatherers and hunter-gatherers in the modern world.

Also offered for graduate-level credit as Anth 557 and may be taken only once for credit. . Prerequis ite: Upper division standing.

## Anth 458 - The Archaeology of Disaster (4)

Examine archaeological approaches to studying human responses to past dis asters, both natural and human-made, and the application of archaeology to contemporary disaster preparedness and related issues. Topics includepast 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 problem in archaeology. Problems may be substantiveor 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-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. 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 once for credit. . Prerequisite: Upper division standing.

## Anth 477-Primatology Field Methods (4)

Methods for collecting behavioral and ecological data on 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 graduate-level credit as Anth 577 and may be taken only once for credit. . Prerequis ite: 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 ofhuman 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.

Als o offered for graduate-level credit as Anth 578 and may be taken only once for credit. . Prerequisite: Upper division standing.

## Anth 479-Forensic Anthropology (2)

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 for credit. . Prerequis ite: 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 aggression and the cultural 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 Dis aster 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 cons iders 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 also explores the roles of perceived risk, connectivity, and social memory. It concludes with an analys is on the successes and failures of humanitarian aid.

Also offered for graduate-level credit as Anth 591.. Prerequisite: Upper-division standing.

## Anth 501 - Res earch (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)

(Credit to be arranged.)

## Anth 510 -Selected Topics (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 anthropologicalmaterials in social and cultural anthropology.

Prerequisite: graduate standing in anthropology and consentofinstructor..

## Anth 512 -Ethnographic Methods (4)

Practical cours ework and community-based experience in res earch 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 human ecology. Social organization as influenced by characteristic patterns of resource exploitation. The uses of natural environment from the 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, and ethical considerations required to conduct applied anthropology in a variety of contexts. Students will carry out independent res earch on a realworld 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 cosmopolitanism, 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 for credit. .

## Anth 517-Advanced Topics in Native American Studies (4)

In-depth examination of a current scholarly topic in the anthropology of Native North America, especially in relation to colonialismand Native resistance. 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 teachus about contemporary environmental problems? Emphasizing key issues of environmental change, adaptation, conservation and sustainability, biocultural diversity, resilience, political ecology, and environmental justice, 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 Anth 418 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-togovernment relations, economic development, natural and culturalres ource 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 for credit. .

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 for credit.
Also offered for undergraduate-level credit as Anth 425 and may be taken only once for credit. .

Anth 526-Transnationalism and Migration (4)
In-depth exploration of globalization, transnationalism, and migration. Topics include colonialismand the history of world connections, the global economic system, cultural imperialism, nationalismand identity, migration, refugees, tourism, and the commodification of local cultures.

Also offered for undergraduate-level credit as Anth 426 and may be taken only once for credit. .

Anth 528-Political Anthropology (4)
Survey of major anthropological approaches to politics, power, activismand socialchange, examined in light of historical and contemporary social tensions around the world. Emphas is on decolonization, political economy, feminist, and critical race theories.
Also offered for undergraduate-level credit as Anth 428 and may be taken only once for credit. .

Anth 530-Myth, Ritual, and Symbol (4)
A critical examination of ooth classic and recent anthropological theories in the cross-cultural study of symbolic forms.

Also offered for undergraduate-level credit as Anth 430 and may be taken only once for credit. .

## Anth 531 - Topics in Latin American in Ethnography (4)

In-depth exploration of a currenttopic in Latin American and Caribbean anthropology, especially in relation to power, structural inequality and violence, culturalidentities, social movements, the State, and postcolonial histories. Course materials will cover both theory and ethnography.
Also offered for undergraduate-level credit as Anth 431. .

## Anth 532 -Gender, Sex, and Sexuality in Anthropological Perspectives (4)

A theoretical introduction to gender, sex, and sexuality, including ethnographic examples from around the world. Explores biologicaland social aspects 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 reproductive technologies, gender-affirmative surgery, and sex work.

Also offered for undergraduate-level credit as Anth 432 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 Anth 435 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 des igners 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 useful forstudents interested in human centered approaches to problem solving and for students pursuing a career in designing innovative products or doinguser experience research.

Also offered for undergraduate-level credit as Anth 440 and may be taken only once for credit..

## Anth 547 - Advanced Topics in Asian Anthropology (4)

In-depth exploration of a current topic in As ian anthropology, especially in relation to social change, nationalismand conflict, colonialism, 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 archaeologicalinquiry: major schools of thoughts, innovations in method and theory, key personalities and their contributions.

Also offered for undergraduate-level credit as Anth 451 and may be taken only once for credit. . Prerequis ite: Graduate standing or ins tructor permission.

## Anth 552 - Archaeological Lab Methods (4)

Learn and practice archaeological lab methods and techniques through analysis of common materials (e.g. lithics, ceramics ) recovered fromarchaeological sites.
Also offered for undergraduate-level credit as Anth 452 and may be taken only once for credit. . Prerequis ite: Graduate standing or instructor permission.

## 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 resource management.
Also offered for undergraduate-level credit as Anth 453 and may be taken only once for credit. . Prerequisite: Graduate standing or instructor permission.

## Anth 554 - Archaeological FieldS chool (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 Anth 454 and may be taken only once for credit. . Prerequisite: Admis sion to course is by permission of instructor via an application process.

## Anth 555-Analysis of Faunal Remains (5)

Reviews issues of recovery, identification, quantification, and interpretation of archaeological faunal remains. Seminar component involves discussion and critical review of recent faunal studies. Laboratory component introduces student to skeletalanatomy of vertebrates (with focus on fishes and mammals) and bas ic procedures used in faunal analysis.

Also offered for undergraduate-level credit as Anth 455 and may be taken only once for credit. .

Prerequisite: Graduate standing or ins tructor permission.

## Anth 556 - Cultural and Heritage Resource Management (4)

Introduction to the preservation, conservation, and management of cultural and heritage resources in North America, including the legal and regulatory frameworks. Topics include agency and privatesector archaeology, laws affecting antiquities trafficking, cons ultation with American Indian tribes and other stakeholders, traditional cultural properties, and landscape.

Also offered for undergraduate-level credit as Anth 456. . Prerequisite: Graduate standing or ins tructor permission.

## Anth 557 - 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-gatherersettlement and mobility strategies, social complexity among hunter-gatherers and hunter-gatherers in the modern world.

Also offered for undergraduate-level credit as Anth 457 and may be taken only once for credit. . Prerequisite: Graduate standing or instructor permission.

Anth 558 - The Archaeology of Disaster (4)
Examine archaeologicalapproaches to studying human responses to past dis asters, both natural and human-made, and the application of archaeologyto contemporary disaster preparedness and related issues. Topics include past human-environment interactions, climate change, vulnerability, risk, and resilience.

Also offered for undergraduate-level credit as Anth 458 and may be taken only once for credit. .
Prerequisite: Graduate standing or instructor permission.

## 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 projectthat shares the benefits of archaeology with the public.

Also offered for undergraduate-level credit as Anth 460 and may be taken only once for credit..

Anth 561 - Advanced Topics in Archaeology (4)
In-depth exploration and analysis of a major current problem in archaeology. Problems may be substantive or theoretical.
Also offered for undergraduate-level credit as Anth 461. . Prerequis ite: Graduate standing or instructor permission.

## 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-g atherer adaptations and cultural evolution. Expected preparation: Anth 364.

Also offered for undergraduate-level credit as Anth 464. . Prerequis ite: Graduate standing or instructor permission.

## 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 consentofinstructor..

## 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. Emphas is 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-level credit as Anth 472 and may be taken only once for credit. .
Anth 577 - Primatology Field Methods (4)
Methods for collecting behavioral and ecological data on 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-level credit as Anth 477 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 ofhuman 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-level credit as Anth 478 and may be taken only once for credit. .

## Anth 579-Forensic Anthropology (2)

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-level credit as Anth 479 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; thebiology of aggression and the cultural meanings of pain; state violence; symbolic and structural violence; and human rights.
Also offered for undergraduate-level credit as Anth 490 and may be taken only once for credit. .

## Anth 591 -Culture, Vulnerability and Dis aster 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 networks and social capital. The class also explores the roles of perceived risk, connectivity, and social memory. It concludes with an analys is on the successes and failures of humanitarian aid.

Also offered for undergraduate-level credit as Anth 491.. Cross-Listedas: 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: Emphasis 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: Ar 101, 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: Emphasis on reading and writing the cursive Arabic script, accurate pronunciation, comprehension of bas ic 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: Emphasis on reading and writing the cursive Arabic script, accurate pronunciation, comprehension of bas ic texts, translation, vocabulary, dictation, basic grammar and syntax, writing Arabic compositions, and media to facilitate the learning ofs imple 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 prosetexts dealing with the popular standard 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 sequenceofthree: 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 prosetexts dealing with the popular standard language, exp anded grammar and syntax, writing Arabic compositions, translation, enhanced vocabulary, dictation, and media for better listening comprehension of standard spoken A rabic, for expanded conversations dealing with daily life. This is the second course in a sequence of 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 prosetexts dealing with the popular standard language, exp anded 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 third course in a sequence of three: Ar 201, Ar 202, and Ar 203.

Prerequisite: Ar 103. Fornon-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: Emphas is on reading prosetexts dealing with a wide spectrum of daily-life topics in their social-cultural context; advanced grammar and syntax (weak verbs, weak nouns, doubled verbs, verb moods, and the conditional); translation of complextexts, writing expanded Arabic compositions; media and Arabic web-sites to enhance conversational skills. This is the first course in a sequence of three: $\operatorname{Ar} 301, \operatorname{Ar} 302$, and Ar303.

## Ar 302 - Third-Year Standard Arabic Term 2 (4)

Intermediate modern literary Arabic prose: Emphas is on reading prosetexts dealing with a wide spectrum of daily-life topics in their social-cultural context; advanced grammar and syntax(weak verbs, weak nouns, doubled verbs, verb moods, and the conditional); translation of complextexts, writing expanded Arabic compositions; media and Arabic web-sites to enhance conversational skills. This is the
second course in a sequence of three: $\operatorname{Ar} 301, \operatorname{Ar} 302$, and Ar303.

## Ar 303 - Third-Year Standard Arabic Term 3 (4)

Intermediate modern literary Arabic prose: Emph as is on reading prosetexts dealing with a wide spectrum of daily-life topics in their social-cultural context; advanced grammar and syntax(weak verbs, weak nouns, doubled verbs, verb moods, and the conditional); translation of complextexts, writing expanded Arabic compositions; media and Arabic web-sites to enhance conversational skills. This is the third course in a sequence of three: $\operatorname{Ar} 301, \operatorname{Ar} 302$, and Ar303.

## Ar 304-Common Spoken Arabic Term 1 (4)

Practicalpan-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. For non-native speakers of Arabic only. This is the first course in a sequence of three: Ar 304, Ar305, and Ar306.

Prerequisite: Ar 203 or consent of Instructor..

## Ar 305-Common Spoken Arabic Term 2 (4)

Practicalpan-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. For non-native speakers of Arabic only. This is the second course in a sequence of three: Ar 304, Ar 305, and Ar 306.

Prerequisite: Ar 203 and Ar304..

## Ar 306 -Common Spoken Arabic Term 3 (4)

Practicalpan-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 third course in a sequence of three: Ar 304, Ar 305, and Ar306.

Prerequisite: Ar 203 and Ar305..

## Ar 311 - Intermediate Media Arabic (4)

Reading and translating intermediate-level Arabic news paper and journal materials; viewing selected media and news websites. For non-native speakers of Arabic only. Does not replace Ar 301, Ar302, Ar 303.

Prerequisite: Ar 301, Ar302, Ar303.

## Ar 330-Topics in Arab Culture and Civilization (4)

Survey of the developmentof 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 prominentpens and styles; reading various exhibits covering all major styles; mastering the writing of the ruq 'ah style. Does not replace Ar 301, Ar302, Ar 303.
Prerequisite: Ar 203 or consent of instructor..
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: ShortStory 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 ins tructor..
Ar 414-Advanced Arabic Grammar (4)
The use ofthe 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 $\operatorname{Ar} 511$ 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 issues and moral values; writing critiques.

Also offered for graduate-level credit as Ar 519 and may be taken only once for credit. . Prerequis ite: Ar 301 and Ar 304 or consent of instructor..

## Ar 420 -Folk Tales of the Arabs (4)

Introduction to the oral tradition ofthe Arabs since early times; analysis of selected folk tales; viewing cultural videos; writing short critiques.
Also offered for graduate-levelcredit as Ar 520 and may be taken only once for credit. . Prerequisite: Ar 303 and Ar 304 or consent of instructor..

## Ar 421 - Extemporized-sung Poetry and Folk Songs of the Arabs (4)

Reading, translating, and analyzing texts of extemporized-sung folk poetry (zajal) covering major genres and lyrics of folk songs composed in vernacular Arabic; viewing videos of social occas ions where thesegenres are performed. Conducted in English.
Also offered forgraduate-levelcredit as Ar 521 and may be taken only once for credit. . 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 is sues and genres; writing critical analysis of poems.
Also offered forgraduate-level credit as Ar 523 and may be taken only once for credit. . Prerequisite: Ar 303 orconsent of instructor..

## Ar $\mathbf{4 2 4}$-Classical Arabic Poetry (4)

Reading, translating, and analyzing selected texts of classical A rabic poems fromprominent Arab poets of early Arabia and al-Andalus covering a wide range of major issues; writing critical analysis ofpoems.
Also offered for graduate-level credit as Ar 524 and may be taken only once forcredit. .Prerequisite: Ar 303 or consent of instructor..

## Ar 427-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 alMuqaffa', 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 for credit. .Prerequisite: Ar 303 or consent of instructor..

Ar 441U- Major Arabic Works in Translation (4)
Study of selected masterpieces of Arabic literature in English translation: short stories, women's essays, poetry, folk literature, and introduction to Arab culture. Viewing critical films and videos. Lectures and discussions in English. Expected preparation:4 credits of upper division literature. Course may be repeated forcredit ifcontent varies. Expected preparation: 4 credits of upper-division literature.

## Ar 490 - History of the Arabic Language (4)

Study ofthe development of classical Arabic language fromearly times, with emphas is on two major schools of Arabic grammar: al-Kufah and alBasrah; contribution of major grammarians, evolution of morphology and syntax; developmentof current Modern Standard Arabic vs colloquial Spoken Arabic.

Also offered for graduate-level credit as Ar 590 and may be taken only once forcredit. .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 political topics.
Also offered for undergraduate-level credit as Ar411 and may be taken only once for credit..

## Ar 513-Advanced Modern Standard Arabic: ShortStory 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 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 $\operatorname{Ar} 511$ 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 Ar419 and may be taken only once for credit. .Prerequisite: Ar301 and Ar 304 or consentof instructor..

## Ar 520-Folk Tales of the Arabs (4)

Introduction to the oral tradition of the Arabs since early times; analysis 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: Ar303 and Ar304 orconsent of instructor..

## Ar 521 -Extemporized-sung Poetry and Folk Songs of the Arabs (4)

Reading, translating, and analyzing texts of extemporized-sung folk poetry (zajal) covering major genres and lyrics of folk songs composed in vernacular Arabic; viewing videos of social occas ions where thesegenres 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 fromprominent Arab poets covering a wide range of is sues and genres; writing critical analys is of poems.

Also offered for undergraduate-level credit as Ar 423 and may be taken only once for credit..

## Ar $\mathbf{5 2 4}$-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 issues; writing critical analysis of poems.
Also offered for undergraduate-level credit 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 alMuqaffa', al-Jahiz, al-Isfahani, Ibn 'Adiy, and Ibn 'Abd Rabbuh; translating texts and writing literary reviews in Arabic.

Also offered for undergraduate-level credit 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 fromearly times, with emphas is on two major schools of Arabic grammar: al-Kufah and alBasrah; contribution of major grammarians, evolution of morphology and syntax; development of current Modern Standard Arabic vs colloquial Spoken Arabic.
Also offered for undergraduate-level credit as 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 organizational 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 ofenvironmental 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 ofboth 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, from freehand 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, blacks mithing 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 construction project management techniques for profitable construction adminis tration. Students will demonstrate knowledgeof course material by completing projects in light construction adminis tration. Coursework includes utilization of estimating, criticalpath, 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 sequenceof 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 history 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 history of architecture understood as a cultural product fromthe 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 representativeof specific cultural beliefs, values, and ideologies in a global context as embodied in architectonic forms and experiences. This is the second course in a sequence ofthree: 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 history of architecture understood as a cultural product fromthe 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 representativeof specific 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 assignments in drawing, modeling, and artfulmaking. 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 assignments 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 second course in a sequenceoftwo: Arch 280 and Arch 281 which must be taken in sequence.
Prerequisite: Arch 280..

## Arch 299-Special Studies (1-6)

(Credit to be arranged.)

## Arch 360 - Building Tectonics 1 (4)

A three-quarter sequence introducing technologies involved 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, envelope design, 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-quarter sequence introducing technologies involved 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
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 from large 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 year standing..
Arch 380 - Architectural Design Studio 1 (6)
Studio investigations offundamental design concepts, is sues, and process. Projects and exercises focusing on the concepts of making threedimens ional forms --organization, proportion, scale, human activities, and introductory site and building design relationships. The releaseof 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 offundamental design concepts, is sues, and process. Projects and exercis es focusing on the concepts of making threedimensional forms --organization, proportion, scale, human activities, and introductory site and building design relationships. The releaseof 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 offundamental design concepts, is sues, and process. Projects and exercises focusing on the concepts of making threedimensional forms --organization, proportion, scale, human activities, and introductory site and building design relationships. The releaseof the student's potential creative capabilities is a primary concern for the course. Includes individualcriticism, 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 (012)

See department for course description. (Credit to be arranged.)

## Arch 405 - Reading or Studio and Conference (012)

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 410U-SelectedTopics (1-4)

(Credit to be arranged.)

## Arch 421 - Urban Design Methods (4)

Introduction to analytical and synthetic research methodolog ies 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 forcredit..

## 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 once for 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 dimens ional 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 forcredit. . 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 designgeneration 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 coursecritically explores emerging urban characteristics, comparative design strategies, and the integration of design approaches with the processes ofeconomic and social change.
Also offered for graduate-level credit as Arch 531 and may be taken only once for credit. . Prerequisite: Upper-divis ion standing..

## Arch 432 -History and Theory of Urban Design

 (4)Introduction to the development of his torical and contemporary urban design with parallel developments 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 once for credit..

## Arch 433-Contemporary Issues Seminar (4)

In-depth exploration of selected topics that explore contemporary issues informing the discipline of architecture. Whether cultural, social, political, economic, aesthetic, environmentalor other, contemporary issues and voices contribute to the dynamic and evolving production, construction and inhabitation of architecture. Topics may include: visual art, literature, aes thetics, ethics, philosophy, politics, culture(s), and technology. Course may be repeated for credit 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 ofdiscussions, presentations, lectures, and readings on relevant 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 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 critical study of cities, buildings, or landscapes, but each will be explored within the comprehensive understanding of the cultural and social conditions of Modernism. Course may be repeated for credit 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 analysis, 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 graduate-level credit as Arch 540 and may be taken only once for credit. . Prerequis ite: Upper-division 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 analys is of design and project proforma, discounted 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 daylighting 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 construction emphasizing sustainable solutions. Includes case study investigations of contemporary innovative material usage and student-designed building component.

Also offered for graduate-level credit as Arch 562 and may be taken only once for credit. . Prerequisite: 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 res isting systems. Precedent studies investigate 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 ofdesign process and methods encompassing concepts of architecture, landscape architecture, and interiordesign. Includes individual criticism, lectures, and seminars. This is the first course in 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 ofdesign process and methods encompassing concepts of architecture, landscape architecture, and interiordesign. 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 -Res earch (0-12)

See department for course description. (Credit to be arranged.)

## Arch 504 -Cooperative Education/Interns hip (012)

See department for course description. (Credit to be arranged.)

## Arch 505-Reading or Studio and Conference (012)

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 ins piration 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 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, from freehand 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-level credit as Arch 423 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 dimensional methods for constructing, editing, visualizing and fabricating architectural ideas. This is the first course in a sequence of two: Arch 525 and Arch 526 which must be taken in sequence. Also offered at undergraduatelevel as Arch 425 and may be taken only once for credit.

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 computational design and digital production of architecture. Arch

526 continues study ofdigital methods of architectural design generation and development. Instructor sets software and topics of investigation (eg. parametric design, digital fabrication, physical computing). This is the secondcourse 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 thoughtby 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 architectureand 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 historical and contemporary urbandesign with parallel developments in architecture and urban planning. Theoretical models are related to currentpractices in the design of various sociopolitical, environmental and aes thetic 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-depthexploration of selected topics that explore contemporary issues 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 undergraduate-level credit as Arch 433..

## 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 relevant topics as they have historically emerged within 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 for credit with different topics.
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 onkey topics. This is the first course in a sequence offour: 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 problemofmodernity as it relates to the discipline of architecture stretching from the colonial to the industrial worlds. Emphasis placed on the criticalstudy of cities, buildings, and landscapes, understood with in the cultural and social conditions of modernity. This is the second course in a sequence offour: 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 ofthe practice of architecture around the globe and across time periods. The course critically 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 historical horizon stretching across theglobe. Emphas is placed
on cities, buildings, and landscapes, each explored within the cultural and social conditions of postmodernity. 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 analysis, 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, contractadminis tration, and standard of care.
Also offered for undergraduate-level credit Arch 440 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 Arch 441 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 analys is of design and project proforma, discounted cash flow and equivalency calculation methods, and conceptualestimating 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 aspects of professional architectural practice through direct case study analys is, reflection and critical apprais al. Emphas is on understanding the application of professionally inspired 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 form generative 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 thes is proposition. Addresses the detailed application of technological know-how 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 reuseof 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. .
Prerequis ite: 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, environmental control, and structural systems. Utilizing contemporary building science research 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 constructiontechnologies. 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: Arch 569..

## 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 non-traditional building materials and structural detailing, exploring the potential of visually expressive structural systems through a series of working models.
Prerequisite: Arch 362. .

## Arch 568-Architectural Technology I (4)

The first in a 3-part sequenceintroducing design and construction technologies. Exploration of the physical properties ofmaterials, 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: graduate standing..

## 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 other environmental 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, alongs ide media and technical skills necessary for advanced graduate study. Creative investigations of architectural design ins pired by human activities, site, landscape, structure, tectonics, communal space and urbanism. Includes individual criticis $m$, lectures and seminars. This is the first course in a sequenceof 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, alongs ide 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 urbanis $m$. 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 in spired by human activities, site, landscape, structure, tectonics, communal space and urbanis $m$. Includes individual criticis $m$, 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.

Prerequisite: Arch 571..

## Arch 573 - Architectural Design Transition Studio IV (6)

Studio projects and critical discussions addressing themes and is sues pertinent to theimaginative 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 Design Studio 7 (6)

Advanced investigations of architectural and urban design issues 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: Graduate standing..

## Arch 581 - Architectural Design Studio 8 (6)

Advanced investigations of architectural and urban design issues in concluding series of studios. Projects include the design of privateand public buildings which require comprehensive, integrative design development. Includes individualcriticism, 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 issues 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 intensive creative 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 ofbuilding systems including materials, envelope, environmental controls, building services, and structure.
Prerequisite: Arch 582. .

## ArH - Art History

## ArH 106- Introduction to Vis ual 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 themto participate fully in our visuallyoriented contemporary society and provide them with a strong foundation for future courses in art his tory, art, and design.

## ArH 110-Visual Literacy (4)

Course is intended to equip students with the neces sary skills to critically view and interpret global visual culture, and to providethem with a strong foundation for future art courses in art his tory, 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 historians. This course investigates art and architecture from the prehistoric 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: $\mathrm{ArH} 204, \mathrm{ArH} 205$, 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 historians. This course investigates art and architecture fromChina, Korea, Japan, Europe fromthe Medieval Through Baroque Periods, Native American Cultures before 1500, and Africa before 1800 . This is the second course in a sequence of three: $\mathrm{ArH} 204, \mathrm{ArH} 205$, and $\operatorname{ArH} 206$. 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 historians. This course investigates Oceanic Art, later Asian art; African, European andNorth American Art from 1800 to the present, and later Native American Art. This is the third course in a sequence of three: $\mathrm{ArH} 204, \mathrm{ArH}$ 205, and ArH 206. Open to non-majors.

## 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 developmentof creative and presentationtechnologies. Emphas is is placed on the theory and critical study of animation. Readings and discussion are combined with extensive screenings of animations and animated films, including the history of computer animation. Open to non-majors.

## ArH 311 U- 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 Asia 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 history. Buddhism, Hinduism, Is lamic architecture, painting, symbolism, and mythology are basic to the arts of Asia.

## ArH 312U- Survey of Chinese Art (4)

A survey of art and architecture of China from prehistoric 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 history. Shamanism, Confucianism, Taoism, Buddhism, Hinduism, symbolism, yin and yang philosophy, and mythology that are basic to the arts ofChina, the influence of central As ian 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 prehistoric 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 basic to the arts of Japan.

## ArH 315U- Chinese Buddhist Art (4)

A concentrated study of the Buddhist art of China and Central Asia. Buddhist art of caves of the Sixdynasties 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; theCentral 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 Buddhistart 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 6 th century to the 18 th century.

## ArH 317U- Chinese Painting (4)

A concentrated study of the Chinese painting from the 3 rd century B.C.E. to the 21 st century.

## ArH 318U- Japanese Painting (4)

A survey of Japanese painting fromthe 4th century to the 20th century. Buddhist paintings, ink paintings, and decorative paintings and modern paintings.

## ArH 319U- Modern Japanese Painting (4)

Recent scholarship in the history of modern Japanese paintings and prints, fromthe Meiji, Taisho, and Showa periods covers major themes of Japan's westernization in a new light. The issues revolve around westernization: conflict and nationalism. New art forms, the revival of traditional styles, the reclining woman theme, and the gaze ofsubjects will be explored. Contemporary Japanese Art will be covered with critical thinking.

## ArH321U- 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 Buddhism's effect on Korea's sculptural, painting, and architectural heritage. Als otreats Confucianismshaping Korean ink painting, folk painting, and porcelains.

## ArH329- Is lamic 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 nonmajors.

## ArH333 U- 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 artists challenged traditionalunderstandings of artis tic 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.

## ArH 337U- Nature into Art (4)

Focuses on a specific theme concerning the relationship of the nature and the environment with the visual arts. Specific themes may include topics such as environmental art, lands cape painting and/or photography, land scape 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 fromthe Neolithic Revolution to the conquest of 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).

## ArH 353U- Ancient Roman and Etruscan Art and Architecture (4)

Art of Italy and the Roman World from 900 BCE-400
CE. Topics include Etrus can funerary traditions, portraiture of the Roman Republic, and how the Roman Empire constructed identity through building
and otherpublic arts. Recommended preparation: ArH204 (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.

## ArH356U- 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 transmis sion of ideas around the Mediterranean. Recommended preparation: ArH 204 (expected of art \& art history majors).

## ArH357U- Byzantine Art and Architecture (4)

Art and architecture of the Byzantine world from the founding to the fall of Constantinople (330-1453 A.D.) Topics include art and politics under Justinian, Iconoclasmand 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 Romanesque era as well as other medieval periods. We look critically at concepts such as magic and science in theirhistorical context to better understand how medieval practices such as alchemy and astrology are represented in art including manuscripts, sculpture, amulets, and early printed books. Expected preparation: ArH 204 (expected of art \& art history majors).

## ArH359U- Gothic Art and Architecture (4)

Gothic art and architecture across Europe from the 13 th to the 16 th centuries. Topics include the development of the cathedral, and therise 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 fromthe period as well as later depictions. Students will analyze both historical texts and more recent representations of the idea of the Crusades, and study how visualcultureplays a role in these polemics.

## ArH 361 U- Northern Renais sance Art (4)

Manuscript illumination, painting, and sculpture in the Netherlands, Germany, and France from the late 14th to the 16th century. Recommended preparation: ArH 205 (expected of art \& art history majors).

## ArH 371 U- Italian Renaiss ance Art (4)

Painting, sculpture, and architecture from the 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 Renaiss ance Art (4)

Painting, sculpture, and architecture fromthe 13th to the 16th century in Italy. This is the second course in a sequence of three: $\mathrm{ArH} 371 \mathrm{U}, \mathrm{ArH} 372 \mathrm{U}$, and ArH 373U. Recommended preparation: ArH 205 (expected of art \& art history majors).

## ArH 373U- Italian Renaiss ance 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 ArH
373U. Recommended preparation: ArH 205 (expected of art \& art history majors).
Prerequisite:..

## ArH376U- Italian Baroque Art (4)

A survey ofmajor trends in Italian art and architecture from the late 16th to the mid-18th century. Open to non-majors.

## ArH377U- 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.

## ArH379U- 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). Emphas is on Mexico and Peru, where the Aztec and Inca empires were located. Survey of the major trends in Spanish colonial painting, sculpture, and architecture.

## ArH381U-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: ArH 381: Neoclas sicism, Romanticism, and Realism; ArH 382: Impressionism and Post-Impressionism. Expected preparation: ArH 206 (expected of art and art history majors).

## ArH382U-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: Impressionism and Post-Impressionism. Expected preparation: ArH 206 (expected of art and art history majors).

## ArH383-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 Surrealism; ArH 384: from American Scene Painting through the rebellious sixties; ArH 385: from Conceptual art through the end of the century. Open to non-majors.

## ArH384-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; ArH 384: 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; ArH 384: 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 - His tory 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 aes thetics and ethics in photography, the role of photography in the fine arts and design, and emerging photographic media.

## ArH 398 - Contemporary Art (4)

Examines developments in world art in the 21st century. Historical roots of contemporary art will also be considered, e.g. the rise of identity politics, postcolonialism, and globalization. Class considers themes such as feminism, postmodernism, activism, and relational aesthetics, 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. Consentof 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. Consentof instructor and chair ofthe Department of Art required. (Credit to be arranged.)

## ArH 402 - Independent Study (1-12)

Terms, section, instructor and hours to be arranged. Consentof instructor and Chair of the Department of Art required.

## ArH 403 - Thesis (1-12)

(Credit to be arranged.)

## ArH 404 - Cooperative Education/Internship (012)

Terms, section, instructor and hours to be arranged. Consent of 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. Consent of instructor and chair of the Department of Art required. (Credit to be arranged.)

## ArH 406 - Projects (1-12)

(Credit to be arranged.)

## ArH407-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.

Prerequis ite: Art History major or permission of instructor..

## ArH 410 - Selected Topics (0-12)

See department for course description. (Credit to be arranged.)

## ArH410U-SelectedTopics (1-4)

(Credit to be arranged.)

## ArH 415U- Issues in Asian Art (4)

Is sues in Asian art may be keyed to museum exhibitions 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 As ian-American artis ts. Open to nonmajors.
Prerequis ite: Upper-division standing..

## ArH 426U- African Art (4)

Examination of selected A frican art forms, styles, and traditions. Emphas is on the context of the art and artist and their relationship to politics and society in African history. This is thes ame course as BSt 470U
and may be taken only once for credit. Open to nonmajors.
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 and Europe. This is the same course as WS 431U and may be taken only once forcredit. Opento nonmajors. Recommended preparation: ArH 206 (expected of art \& art history majors).

Prerequisite: Upper-division standing.. Cross-Listed as: WS 431U.

## ArH 432 U - Is sues 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, surrealis $m$, and sexuality. Open to nonmajors. Recommended preparation: ArH 206 and either ArH204 or ArH 205 (expected of art \& art history majors).
Prerequisite:Upper-division standing..

## ArH 449 - Art His tory Methods (4)

Seminar for juniors and seniors. Explores major approaches to the study of art history through readings, discussion, and essays. Includes the development of art history as a field and common methodologies such as iconography, gender theory, social art history, and post-modernismand poststructuralism. 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. Open to non-majors, Recommended preparation: ArH 204, 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 - Art and the Early Modern City (4)

Each iteration of this courseexplores theart, architecture, and urban development of a different renais sance or baroque city. 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 nonmajors. This is the first course in a sequence oftwo: ArH486 and ArH 487. Expected preparation: ArH 206 (expected of art \& art history majors).
Prerequis ite: 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 nonmajors. This is the second course in a sequence of two: ArH 486 and ArH 487. Recommended preparation: ArH 206 (expected of art \& art history majors).
Prerequisite: Upper-division standing..

## ArH 499 - Contemporary Art II (4)

A thematic examination of istorical 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 looks at cross-cultural and interdisciplinary connections. Suggested preparation: ArH 491, ArH 492, ArH 493, and ArH 498.

Prerequis ite: ArH 206 and upper-division standing..

## ArH 501 - 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 503 - Thesis (1-9)

(Credit to be arranged)

## ArH 504-Cooperative Education/Internship (012)

Terms, section, instructor and hours to be arranged. Consent of 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. Consent of instructor and chairofthe 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 history through readings, discussion, andessays. Includes the development of art history as a field and common methodologies such as iconography, gender theory, social art history, and post-modernismand poststructuralism. 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 divisionart 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 orMedieval Venetian Architecture. May be repeated for credit with different topics. Open to non-majors.

Also offered for undergraduate-level credit as ArH 450. . Prerequisite: graduate-level standing and permission 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-Modernis m, 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 historical dimensions of contemporary art practices in the 21st century. Explores themes, movements and trends as much as individualartists or works of art. Places art into a broad historical and social context, and looking at cross-cultural and interdisciplinary connections. Recommended preparation: ArH 591, ArH 592, ArH 593, ArH 598.
Prerequisite: admis sion 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 two-dimensional design and color theory. No prerequisites. Opento 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 School of Art + Design.

## Art 103 -CORE: Time (5)

Introductionto 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 thathelp 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 Schoolof Art + Design.

## Art 104 -CORE: Digital Tools (2)

Introduces students to various dig ital tools, applications, and creative modes to share, dis tribute and produce art works. Students will expand their practice and understanding of howsmartphone technologies, social media and online platforms can be used for creative outcomes. Students will learn to produce, as semble, manipulate andedit 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 dis cussions, collaborations, and field trips. Open to major or minors in Schoolof Art + Design

## Art 105-CORE: Ideation (2)

One of the biggestchallenges for creative people is taking an idea envis ioned in the mind and turning it into reality. Ideation introduces students to techniques for bringing ideas tolife. In this course, students will be introduced to a variety oftechniques and concepts that focus on the generation, development and communication ofnew ideas. Open to major or minors in School of Art + Design or with faculty permission.

## Art 131 - Introduction to Drawing I (4)

Introduction to observational, expressive, and formal modes ofdrawing. Critical approaches drawn from art history, aesthetics, and art criticismare examined relative to these modes of drawing to establish methods of evaluating art and placing one's own work and that ofothers in a historical context. Emphasis on strategies, methods, and techniques for trans lating three-dimensional formand space onto a two-dimensional surface using the language of line and value, and the illusion of depth and texture. Mark-making and its expressive 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 ofsewn construction for applications in costume, fashion, textiles, and contemporary art.

Prerequisite: Major or minor or in the SchoolofArt + 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 responding 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. Opento 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 from observation. 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 ofthreeclasses. Develops, skills in observation and perception. Later, analytic skills are combined with personal expression and invention. A variety of media is used to explore the implications ofline and modeled formto explore the figure in compositional environments. The skeleton and muscles 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 two-dimens ional 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 aes thetics of animation are investigated through the design and production of a two-dimensional animation. Focus may be placed on either pixel or vector graphics. Projectplanning 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 three-dimensional modeling and animation composed in digital form. Projects apply tools and techniques for modeling, lighting, surface rendering, scene construction, animation sequencing, editing, and the integration of sound and music. The language and aes thetics 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 35 mm 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 discuss 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-s tops and shutter speeds. Automatic cameras must havemanualoverride. Expected preparation for Art \& Art History 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 basic 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 "reliefprintmaking". This specialized technique will be presentedutilizing 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 developed through 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 ()

A studio focused course concentrating on the Intaglio method of Printmaking also identified as "Etching". This specialized technique will introduce basic theories, practice and concepts unique to historic, traditional/nontraditional and contemporary Printmaking methodology. Monoprinting (oneofa kind image making processes) and edition printing -sequential image making will be explored. Technical processes of black and white drypoint, etching and softground will be at the core of the students investigation. Understanding manipulation of technical processes unique to etching, additive and subtractive processes will be equally explored. Graphic languages developed through res earching 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. Zinc and copper plates will be the central focus of this introductory course. May be repeated twice for credit. Maximum 8 credits.
Prerequisite: Art 131.

## 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 as signments that develop ideation and critical
thinking. 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 engaging 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 inves tigated 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 ofdigital 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 sequentialstructures. Traditional and experimental methods ofbinding will be taught. Lectures on the history of the artist's book and is sues in imagery and/or typography 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 318-Weaving: Pattern \& Structure (4)

An introduction to the conceptual and technical aspects of weaving. Students will be introduced to hand-weaving on a floor loomand 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 incorporate dyeing and handmanipulated 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 301 -Processes andPractices of the Creative Industries (4)

This course provides an overview of creative industries, its practices, production, and consumption, and its importanceto global knowledge-based economies. Students are introduced to key creative indus tries 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 $k-5$ levels. This course is required for all students seeking a general multi-subject teaching license at the elementary level. General objectives includeestablishing a theoretical and methodological foundation 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, criticism and aesthetics. Open to Non-majors. Maximum4 credits.

## Art 313-Textile Design (4)

Intended for upper-division students wanting to incorporated 2D textile materials and processes into their establis hed creative practice. Students gain exposure to sourcing and manipulating experience textiles through a combination of hand and digital processes - including immers ion 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.
Prerequis ite: 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 formanipulating commercial patterns, adding structure to fabric and pliable material, and advanced methods of machine sewing. Lectures and readings exposestudents to the history of fiber, the use of textiles in contemporary art, and applications in fashion and costume.
Prerequisite: Art 216 or instructor consent. The course is restricted to ArtPractice Majors/Minors..

## Art 322U- History of Dress I (4)

Throughouthumanhis tory, dress and adornment have been vehicles for communicating both individual and collective identities. This course examines clothing and its context fromPrehistory1900.

Prerequisite: Upper-division standing.. Cross-Listed as: This is the same course as TA 322 U and may be taken only once for credit..

## Art 323U- His tory of Dress II (4)

Throughouthumanhis tory, 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 for credit..

## 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 School Museumof Contemporary Art, a contemporary art museum inside a functioning K-5 public school. The students work collaboratively in teams to research the surrounding neighborhood and prepare presentations/zines about an artist exhibiting at KSMoCA. Students work as mentors with elementary students, and they help to install a museum exhibition. 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 quartercentury. 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 critical response 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 perspectives 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 term for 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 finalyear 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 artists' research methods and explores a range of strategies and platforms for presenting art work in public settings. Students collaborateon theme-based projects that culminate in public presentations. Cours ework 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 ofskills 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 356 - Visual Storytelling (4)

Studio course exploring strategies of representation of stories, characters, and other narrative elements in time-based 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). Opento 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 organizations in Portland. History of community and independent media. Basic video and audio recording, post-production, interviewing, and group decisionmaking 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, aesthetics, and ethics of photographic imaging and image-making 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 artists 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 productiontechniques are practiced as portfolios are assembled and published in a variety of print, timebased, 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/orprocess. 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 historical and contemporary strategies of visual analysis, surface and space as tools for creativeexploration.

Prerequisite: Art 230.

## Art 392 - Intermediate Painting (4)

Using traditional and contemporary technical processes and conceptual ap proaches, students start developing a personal vocabulary with emphasis on the relationship of form and content, while investigating a variety of ways of researching and applying methods towards developing a body of work.

Prerequisite: Art 282 or consent of instructor..

## Art 393 -Painting Topics (4)

Intermediate level special topics in painting basedon 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 instructor and Chair of the Department of Art required.

## Art 401-Research (1-8)

(Credit to be arranged.) Terms, section, instructor 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 instructor 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, ins tructor and hours to be arranged. Consent of instructor and chair of the Department of Art required.

## Art 405-Reading or Studio and Conference (1-9)

(Credit to be arranged.) Terms, section, ins structor and hours to be arranged. Consent of ins tructor and chair of the Department of Art required.

## Art 406 -Projects (1-8)

(Credit to be arranged.) Terms, section, ins structor 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, ins structor, 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-Selected Topics (1-12)

(Credit to be arranged.) Maximum: 12 credits in one area.

Prerequis ite: 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, ins tallation, 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 Art and 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 project ideas. General class engagement and journal writing will form the basis 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 theoperation of the King School Museumof Contemporary Art, and they lead reading discussions pertaining to topics as sociated with the museum, mentor elementary students, and help to install a museumexhibition. Collaboration, res earch, 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, orpermission 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-levelcredit as Art 530 and may be taken only once for credit.. Prerequisite: Art 330.

## Art 439 - BFA Vertical Lab II: Collaboration and Presentation Strategies (4)

Second of a two-termsequence that introduces research methods, strategies and project management skills for publicly presenting artwork. Students collaborate on theme-based projects that culminate in public dis play. Cours ework includes lectures, demonstrations, studio production and field trips. Required for BFA.

Prerequis ite: Departmental admission to the Art Practice BFA, Art 339 and Art 336 or consent of instructor..

## 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 from observation 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-Bas ed Art Studio (4)

Advanced studio course focused on production of time-based arts including video art, animation, sound, performance, experimental film, installation, and other interdisciplinary forms. Course content focuses on the repres entation 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 artwork. 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 forcredit. . Prerequisite: Upperdivision 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 allows 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 diverse forms and the commercial operation of photographic studios. Projects investigate one or more specialized forms of photographic practice, such as product, architectural, portrait, landscape, photo-illus tration, or immers ive 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 seminar explores is sues of professional development for artists. Senior level art majors will be exposed to information that will aid themin the transition fromstudent 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 assistance, this course concentrates on working methods of research and execution towards a specifically proposed project. Research, idea generation and production are emphas ized 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 forcredit. . 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 once for credit. . 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 history and contemporary theory. Open to non-majors who have prerequisites and consentof 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 historical and theoretical context. Maximum 4 credits.

Also offered for graduate-level credit as Art 594 and may be taken only once forcredit. . 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 once for credit. . Prerequisite: Art 494 or consent of ins tructor..

## Art 496 - BFA Project I (4)

Studio production and exhibition 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. Inves tigate 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 presentand touch on the key movements. Will place a strong emphasis on contemporary examples of social practice art through readings, assignments, and online participation. This course will give a his toric and critical context for social art. Open to nonmajors.
Also offered for graduate-level credit as Art 597 and may be taken only once forcredit. . Prerequisite: Upper-division 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 oftwo: 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. Co-requisite: Art 498.

Prerequisite: Art 336 and Art 496. Corequisite: 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. Consent of 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 emphas is on organizing historical, aesthetic, critical and studio demonstrations, lectures, and classroom/model presentations. Translating theory(ies) into practice(s) will be a continuing and ongoing focus of the classes in lessons, res earch and readings. Students will develop Art les sons 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 issues 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 forteaching and coordination of art programs in grades 5-12, with an emphasis on organizing his torical, aesthetic, critical and studio demonstrations, lectures, and classroom/model presentations. Translating theory(ies) into practice(s) will be a continuing and ongoing focus of the classes in lessons, research and readings. Students will develop Art les sons and programs that reflect current state and national standards. Art 514 is an introduction to thehistory of Art Education, the methods of instruction, philosophy of art education, and organization of art materials and tools. Art 515 explores the currentbest 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 theoperation of the King School MuseumofContemporary Art, and they lead reading discussions pertaining to topics associated with the museum, mentor elementary students, and help to install a museumexhibition. 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 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 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 inexpensivetechniques to create media artwork. Course topics includecell 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 undergraduatecredit as Art 457 and may be taken only once forcredit..

## 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 critiqueof their own work. This course allows for a variety of photographic methods. Graduate students are required to complete an additional res earch project. This course is repeatable.

Also offered for undergraduate-level credit as Art 461..

## Art 562 - Professional Practices in Photography

 (4)Introduces senior and graduate students to the photography profession in its diverse forms and the commercial operation of photographic studios. Projects investigate one or more specialized forms of photographic practice, such as product, architectural, portrait, landscape, photo-illustration, 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. . Prerequis ite: Graduate-level standing and instructor's consent..

## Art 578 -Studio Practice: Workshop(2)

This course is a co-requis ite 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 emphas is on the relationship between res earch, 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 assess the strength of developing work, enhances their ability to speak about their work and the work of their peers and gives them widerview into is sues and aspects of studio production. Includes reading assignments, student-led discussion, guest speakers and field trips. May be repeated for credit. Maximum credits 24. Required for MFA.

Prerequisite: Admis sion 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-inprogress in relation to contemporary art practices and criticism, historical practices, technical and formal concerns and/or related interdisciplinary interests. Directed assignments and courseof study will be given as appropriate. May be repeated for credit. Maximum credits 40. Required forMFA.
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 res earch interests determine course material. Examples of topics include: post-colonialismand Diaspora; is sues in feminism; gender and queerstudies; modernisms and modernity; new technologies and digital culture; autobiography and memoir; cultural production and censorship; globalismand new economies of art. Course format consists of assigned readings, discussion and a writing component. Field trips, student presentations, screenings and as signed lectures may also be included. May be repeated for credit. 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. Coursematerials 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: second-yearstudents 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 highered. This seminar includes curriculum development, syllabi development, assessment, educational objectives reading and discussion of post-modern theory and
other matters in the area of art education and visual culture. Required for MFA. Maximumcredits 2.

Prerequisite: Admission in to the MFA in Contemporary Art Practice program.

## Art 584 -Social Practice: DirectedStudies (2)

Tutorial and directed study in social practice production with a supervising faculty member. Indepth discussions and assessment 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 in to the MFA in Contemporary Art Practice program.
Art 585-MFA Graduate Seminar IV: Professional Practices (2)

Explores practical is sues 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, nonprofit and community arts organizations. The course includes guest speakers and individual research projects. Required for MFA.

Prerequisite: Admission in to 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. Visiting artists participate in group critiques, and/or conduct individual studio critiques. May be repeated forcredit. 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 final MFA exhibition project. Conduct supporting research and studio production with approval of the students' individual MFA advisor, Exhibition committee chair and committee members. Required forMFA.
Maximum credits 4.
Prerequisite: Admission in to the MFA in Contemporary Art Practice program.

## Art 590 - Advanced Painting (4)

Through guided individual assistance, 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-level credit as Art 490 and may be taken only once for credit. . Prerequisite: Art 393 or MFA/graduate status or consent of ins tructor..

## 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 subtitles highlighting the selected topic.
Also offered for undergraduate-level credit 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 history and contemporary theory. Open to non-majors who have prerequisites and cons ent of the instructor. Maximum 8 credits .

Also offered for undergraduate-level credit as Art 493 and may be taken only once for credit. .
Prerequisite: Graduate-level standing and instructor'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 historical and theoretical context. Maximum 4 credits.
Also offered for undergraduate-level credit as Art 494 and may be taken only once for credit. . Prerequis ite: Graduate-level standing..

## 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: Graduate-level standing..

## 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 social practice from 1920 to present and touch on the key movements. Will place 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 undergraduate-level credit as Art 497 and may be taken only once for credit. . Prerequisite: Graduate-level standing..

Art 598-Social Practice: Workshop (2)
This course is a co-requisite to Art 584 Social Practice: 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 the creative aspectand 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 program coordinator. Required for MFA. Maximumcredits 2.

Prerequisite: Admis sion 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 (112)

(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 Deafcommunity. 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 Term 3 (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.)

## ASL201-Second-Year American Sign Language Term 1 (4)

Expansion and refinement of first-year comprehensionand production skills; expansion of grammatical and lexical repertoires through taskbased 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 first course in a sequenceofthree: ASL201, ASL 202, and ASL 203. Expected preparation: ASL 103 for ASL201, ASL 201 for ASL202, ASL 202 for ASL203.

## ASL202-Second-Year American Sign Language

 Term 2 (4)Expansion and refinement of first-year comprehension and productionskills; expansion of grammatical and lexical repertoires through taskbased 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 ASL203.

## ASL203-Second-Year American Sign Language Term 3 (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 third course in a sequence of three: ASL201, ASL 202, and ASL203.

## ASL 299 - Special Studies (1-8)

(Credit to be arranged.)

## ASL301 - Third-Year American Sign Language Term 1 (4)

This course will ass ist students in developing improved and advanced vocabulary, receptive and expressive 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 Deafand hard of hearing ASLusers.

Prerequisite: ASL203. Corequisite:NA.

## ASL302 - Third-Year American Sign Language Term 2 (4)

This course aims to improve receptive and expressive fluency ofstudents in two essentialelements 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.

## ASL303 - Third-Year American Sign Language Term 3 (4)

This course focuses on the advancedutilization 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.

## ASL330 - Deaf Culture (4)

Introduction to major aspects of American Deaf Culture such as the history of deafculture and community, its art, literature, folklore and language (American Sign Language), including current
attitudes, movements, policies, and trends that affect the Deafas a linguistic minority.

ASL399-Special Studies (1-8)
(Credit to be arranged.)

## ASL 402 - 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

## BA 100 - Summer Business Institute (1)

The Summer Business Institute is a unique opportunity for high school students to explore the world of business with Portland Statebusiness faculty and localbusiness leaders. The institute will provide an overview of the functional areas of businessand 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.

## BA101 - Introduction to Business and World Affairs (4)

Introduction to the business firmoperating in the local, national, and global marketplace. Emphasizes the integration of the various functional areas of businessas 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
businessenvironment. Students will learn how to use library and Internet resources to collect information. Word processing, spreadsheet, and graphics applications will be used to organize and present business information. Students will be introduced to businessreport 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 performanceof the firm. Balance sheets, income statements, statements of cash flows, and industry reports will be used to introduce topics such as: as sessing 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 as sessment, cash management, operations and capital budgeting, manufacturing cost systems, cost control procedures, managing inventory, problemsolving, and meas uring the health of the organization.
Prerequisite: BA 211..

## BA 299 - Special Studies (1-6)

(Credit to be arranged.)

## BA301-Res earch and Analysis of Business Problems (4)

Development and useof 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 theresults orally and in writing. Students will integrate and reinforce their skills 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 organizational). Key topics include: the nature and dynamics ofteams, 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 term research papers.
Prerequisite: BA 301 or concurrent registration in BA 301..

## BA303-Business Finance (4)

Developmentand study of a decision framework for financial management with special emphasis on small- and medium-sized businesses. Topics include analys is 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 sys temapproach 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 businessminors and non-business majors. Reading and interpreting income statements and balance sheets, especially for small businesses. Forecasting to determine financing requirements. Useoftechniques in time value ofmoney to determine presentvalues, loan payments, etc. Sources of business financing.

## 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, useoftechnology 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 NonBusiness Majors (4)

Essentialtopics in marketing for business minors and non-business majors. Students will be introduced to the basic concepts of marketing and customer satis faction. 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 bus inessleaders need to be successful. Data represent people, places, things, activities, and events in a business. Making sense of 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 beyond. Students have long-termaccess to the SimNet library so the resource travels with themthroughout their education and career.

Prerequisite:BA 213, Ec 202, Stat 241 or Stat 244..

## BA326U- Essentials of Management for NonBusiness Majors (4)

Essentialtopics in management and business communications for business minors and nonbus iness 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 businesssetting.

## BA327-Data Analysis \& Vis ualization (2)

This course is required ofall business students in order for themto have bas ic competency in Data Analytics and be able to succeed in 400-level discipline specific Data Analytics courses as well as for themto perform well in the BA 495 Capstone class. Using a large dataset from industry, this twocredit combined-lab-and-lecture course will give students experience with tools while walking them
through the data analytics cycle in order to prepare students for the work force, and their 400-level SB coursework.

Prerequisite: BA 325..

## BA332U- 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.

## BA336U- Essentials of Information Technology for Non-Business Majors (4)

Discusses the importance of information and its support of a business organization. An understanding of the es sential relationships among information, businessprocess, and information technology. This is a survey course for business minors and non-business majors.

## BA339-Supply Chain Management (0-4)

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 corporates trategy through design and operating decis ions. Issues such as global supply sources, worldwide bus iness systeminfluences, continuous improvement, and totalquality management will be discussed.

Prerequisite: BA 301 or concurrent registration in BA 301 .

## BA 339L- Lab for BA 339 (0)

Lab for BA 339.

## BA346U- Essentials of Entrepreneurshipfor Non-Business Majors (4)

Team-based capstone course in the business minor that provides students experiencedeveloping a new businessopportunity and transferable skills applicable to entrepreneurship, intrapreneurship, and the promotion ofnew 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 business pitch.

## BA 385 - Business Environment (4)

Study and critical analysis of the role ofbusiness in its environment with special references to the interrelationships of legal, technological, economic, political, and social forces with the business enterpriseand 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.)

## 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.

## BA BA - Practicum(1-12)

(Credit to be arranged.)

## BA410 - Selected Topics (1-6)

(Credit to be arranged.)

## BA423-Executive Perspectives on Leadership(1)

This course provides students the opportunity to interact and learn directly fromexecutives at forprofit, not-for-profit 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)

Caps tone 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/organization strategies. Students join an interdisciplinary team; pool their knowledge, skills, and interests; uses trategy 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.)

## BA 504 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## BA 505 - Reading \& Conference (1-8)

(Credit to be arranged.)

## BA506-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.

## BA508-Workshop(2)

Credit to be arranged.

## BA509-Practicum(1)

Credit to be arranged.

## BA 510 - SelectedStudies (1-9)

(Credit to be arranged.)

## BA521-LeadershipDevelopment and Assessment (2)

This course is the first stage for the development of leadership competencies in the MBA program. Students will be involved in various activities to assess 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 communicationskills, including writing, speaking and listening. Students will learn how to create and engage in clear and wellstructured 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 forprofit, not-for-profit 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-level credit as BA 423..

## BA524-LeadershipImmersion (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 courserequires 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.

## BA526-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 coursetopics 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 order to participate in the MBA International Experience..

## BA 527 - MBA Domestic Business Experience (4)

Explores globalbusiness is sues through the lens of one or more ofthe 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-cultural communication in the business setting.

## BA529-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.

## BA530-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 the needs of the business community.

## BA548-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 As ia, Global Marketing, Global Human Resource Management, etc. Only open to graduatestudents of the School of Business Administration. May berepeated with different topics; maximum of 12 credits may be applied to the master's degree.

## BBE - Bilingual Bicultural Ed

BBE 404 - Cooperative Education/Interns hip (112)
(Credit to be arranged.)

## BBE407-Seminar (1-12)

(Credit to be arranged.)

## BBE 410 - SelectedStudies (1-12)

(Credit to be arranged.)

## BBE 424 - 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 pers onal 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: Admission to the BilingualTeacher Pathway Program.

## BBE 432 - Language and Literacy Development for Diverse Learners (3)

Course designed for preservice teachers to help them guide elementary, mid-level, and secondary students in acquiring skills needed for reading, thinking, writing, and study in the content areas. Emphasis on the functional teaching of reading and writing- the design and preparation of materials to use with textbooks in all school subjects.

Also offered for graduate-level credit as BBE 532 and may be taken only once for credit.. Prerequisite: Admission to the BilingualTeacher Pathway Program.

## BBE 434 - Planning, Ass essment, 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, thoughtful instructional strategies and best practices in specific content areas, and how to develop formative classroomas sessments that are standards-based and are aligned with instruction and curriculumdesign.

Also offered for graduate-level credit as BBE 534 and may be taken only once for credit.. Prerequisite: Admission to the BilingualTeacher Pathway Program.

## BBE 502 - Independent Study (1-9)

(Credit to be arranged.)

## BBE 504 - Cooperative Education/Internship (1-9)

(Credit to be arranged.)

BBE507-Seminar (1-6)
(Credit to be arranged.)

## BBE 509 - Practicum (1-9)

(Credit to be arranged.)

## BBE510-SelectedStudies (1-15)

(Credit to be arranged.)

## BBE 524 - 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 forteachers and K-12 students and become knowledgeable on educational law. Students will develop an initialteaching philosophy paper that will reflect their personal expres sion 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 BBE 424 and may be taken only once for credit.. Prerequisite: Admission to the Bilingual Teacher Pathway Program.

## BBE532-Language and Literacy Development for Diverse Learners (3)

Course designed for preserviceteachers to help them guide elementary, mid-level, and secondary students in acquiring skills needed for reading, thinking, writing, and study in the content areas. Emphasis on the functional teaching of reading and writing- the design and preparation ofmaterials to use with textbooks in all school subjects.

Also offered for undergraduate-level credit as BBE 432 and may be taken only once for credit.. Prerequis ite: Admission 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, thoughtful instructional strategies and best practices in specific content areas, and how to develop formative clas sroomas sessments that are standards-based and are aligned with instruction and curriculumdesign.
Also offered for undergraduate-level credit as BBE 434 and may be taken only once for credit..
Prerequisite: Admission to 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 sequence of 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 sequence of three: Bi 101, Bi 102, and Bi 103. Concurrent enrollment 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 sequence of three: $\mathrm{Bi} 101, \mathrm{Bi}$ 102 , and Bi 103 . Concurrentenrollment in $\mathrm{Bi} \mathrm{104}$, 105, Bi 106 required.

## Bi 104 - General Biology Labs (1)

Laboratory to accompany GeneralBiology (Bi 101, Bi 102, Bi 103). This is the first lab in a sequenceof 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: $\operatorname{Bi} 101$.

## Bi 105 - General Biology Labs (1)

Laboratory to accompany General Biology (Bi 101, Bi 102, Bi 103). This is the second 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 106 - General Biology Labs (1)

Laboratory to accompany General Biology (Bi 101, 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-depthstudy 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 philosophy 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 ofliving systems; cell and molecular structures and interactions, and genetics and heredity, as applied to issues such as cancer, nutrition, reproductive and genetic testing, and biotechnology. Fulfills the science requirement for non-majors. 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 includeecological principles, population ecology, and public health. These will trans late into a better scientific understanding of ecology and health. Fulfills the sciencerequirements 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 to fundamental principles of evolution, origins, and diversity of life on Earth. Topics include his tory, development, mechanisms and processes ofevolution, patterns of ancestry, diversity and extinction, and surveys of the major life forms including the origin and evolution of modern humans. Fulfills the science requirement for nonmajors. 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 univers ity laboratory science requirement.

## Bi 205 - Fundamentals of Biology Laboratory: Ecology Conservation and Health (1)

A laboratory course to accompany 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 university laboratory science requirement.

## Bi 207 - Biology for AlliedHealth I (4)

Three-termpreparatory biology lecture and integrated lab course forstudents preparing for allied health career tracks. Bi 207: Cell, Molecular and Genetics: topics include cell structure and function, molecular basis of life, cellularbas is of reproduction, heredity and genetics. Bi 208: Evolution and Divers ity of Life: topics include origin andevolution of diversity of life from viruses and microbes to vertebrates; animal behavior, organismal 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 exercises emphasize the process ofscientific 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 AlliedHealth Lab I (0)

Biology for Allied Health Lab.
Corequisite: Bi 207.

## Bi 208 - Biology for Allied Health: Evolution and Diversity of Life (4)

Three-termpreparatory biology lecture and integrated lab course for students preparing for allied health career tracks. Bi 207: Cell, Molecular and Genetics: topics include cell structure and function, molecular bas is oflife, cellular basis of reproduction, heredity and genetics. Bi 208: Evolution and Divers ity of Life: topics include origin andevolution of diversity of life from viruses and microbes to vertebrates; animal behavior, organismal 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 exercises emphasize the process ofscientific inquiry using critical thinking and communication skills. This is the second course in a sequence of three: $\operatorname{Bi} 207, \operatorname{Bi} 208$, and $\operatorname{Bi} 209$.

Corequisite: Bi 208 L .

## Bi 208L-Biology for AlliedHealth Lab II (0)

Biology for Allied Health Lab.
Corequisite: Bi 208.

## Bi 209 - Biology for AlliedHealth: Anatomy and Physiology Systems (4)

Three-termpreparatory biology lecture and integrated lab course fors tudents preparing for allied health career tracks. Bi 207: Cell, Molecular and Genetics: topics include cellstructure and function, molecular basis of life, cellular bas is of reproduction, heredity and genetics. Bi 208: Evolution and Divers ity of Life: topics include origin and evolution of diversity oflife from viruses andmicrobes to vertebrates; animal behavior, organismal 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 exercises emphasize the process of scientific inquiry using critical thinking and communication skills. This is the third course in a sequence of three: Bi 207 , Bi 208, and Bi 209.

Corequisite: Bi 209L.

## Bi 209L-Biology for AlliedHealth Lab III (0)

Biology for Allied Health Lab.
Corequisite: $\operatorname{Bi} 209$.

## Bi 211 - Principles of Biology: Molecular Cell Biology \& Genetics (4)

Study of the basic principles of living organisms. This course will study the molecular and cellular underpinnings of living organisms. Specific topics include biochemistry, cell biology, molecular biology, biotechnology, microbiology, and genetics. Four hours lecture. Co-requisite: Bi 214 Laboratory.
Prerequisite: Ch 221 and Ch 227, or concurrent enrollment in Ch 221 and Ch 227 .. Corequisite: Bi 214.

## Bi 212 - Principles of Biology: Development, Evolution \& Ecology (4)

Study of the basic principles of living organisms. This course focuses on the development, evolution and ecology of living organisms. Specific topics include plant and animal development, natural selection, speciation, form function of organisms, biodiversity, and the introduction of major phyla. Four hours lecture. Co-requisite: Bi 215.
Corequisite: $\operatorname{Bi} 215$.

## Bi 213 - Principles of Biology: Organisms, Biodiversity \& Conservation (4)

Study of the basic principles of living organisms. This course focuses how biotic and abiotic factors impact living organisms and the physiological underpinnings that allow organisms to survive. Specific topics include ecology, physiology, org anis mal systems (water balance, gas exchange, nervous, circulatory, endocrine), community and population ecology, biodiversity and conservation. Four lecture hours. Co-requisite: $\operatorname{Bi} 216$.

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 3hour 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 3hour 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 3hour laboratory. Graded only.
Corequisite: Bi 213.

## Bi 234 - Elementary Microbiology (4)

Introduction to the basic and applied aspects of microbiology, with special emphasis on therole 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 aspects of water and sewage treatment, aspects of microbial gene flow, genetic engineering, and vaccine development.

## Bi 235-Microbiology Laboratory (2)

The laboratory is designed forscience majors and others who need practical experience in culturing and observation of microorganisms. Topics will include culture techniques, useofthe microscope for observation of microorganisms, and procedures for
study of microorganisms 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 biologicalentity. One 3-hour laboratory. This is the first course in a sequenceof three: $\mathrm{Bi} 301, \mathrm{Bi} 302$, 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 - or higher) 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 biologicalentity. One 3-hour laboratory. This is the second 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.
Corequisite: Bi 302L.
Bi302L-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 biologicalentity. One 3-hour laboratory. This is the third course in a sequence of three: $\mathrm{Bi} 301, \mathrm{Bi} 302$, 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.

Corequisite: Bi 303L.
Bi 303L-Human Anatomy and Physiology Lab (0)

Lab for Bi 303.
Corequisite: Bi 303 .
Bi 320 -Introduction to Organis mal Physiology (4)

An overview offundamental principles of phys iology. Course covers thephysical and chemical mechanisms responsible for how animals, plants and microbes function.
Prerequisite: Prior completion ofBi211, 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 mechanisms responsible for early morphogenesis. One 4-hour laboratory period.

Prerequisite: Completion ofBi 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 oforgan systems in representative vertebrate forms. Two 4-hour laboratory periods.
Prerequisite: Completion ofBi 212 with a C- or above.. Corequisite: Bi 328L.

## Bi 328L-Comparative Vertebrate Anatomy Lab (0-1)

Lab forBi 328.
Corequisite: Bi328.

## Bi 330 -Introduction to Plant Biology (4)

Plant diversity, structure and function in relationship to evolution, habitat, and interactions with other organisms. His torical impacts of plants onhuman culture, including conservation, biotechnology, and world food supply.
Prerequisite: CompletionofBi 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 Bi 211 with a C- or above..

## Bi 336-Cell Biology (5)

Biology of eukaryotic (plant/animal) and prokaryotic 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 mechanismofbiological inheritance. One 2-hour recitation period.

Prerequisite: Completion of Bi 211 with a C- or above.. Corequisite: Bi341R.

## Bi 341 R-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 historical context. Emphasis on the ethical is sues arising from the 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-Listedas: 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 environmental problems.
Prerequisite: Bi 211, Bi 212, 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 research. Expected preparation: Bi341.

Prerequisite: Completion of Bi 211, Bi 212, 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 phys iological adaptations 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 3hour 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 his tories of visible fungi(mushrooms). Two 3-hour laboratory periods; field trips.
Prerequisite: Successful completion ofthe Principles of Biology sequence ( $\operatorname{Bi} 211$, $\operatorname{Bi} 212$, Bi 213, Bi 214, Bi 215, Bi 216) with a C- or higher.. Corequis ite: Bi 370L.

## Bi 370L-Mushrooms Lab (0)

Lab for Bi 370 Mushrooms.
Corequisite: Bi 370 .

## Bi 380 -Microbiology (4)

Fundamentalconcepts and techniques of microbiology. The general principles of microbial cell structure and function, physiology and biochemistry, growth, survival, classification, and divers ity are emphasized.

Prerequisite: Prior completion of any of the following: Bi 334 Molecular, Bi 336 Cell, or Bi 341 Genetics with a C- or 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 2-hour lectures, one 3-hour laboratory, with some field trips outside of class time.
Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above.. Corequis ite: 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 Bi 211, Bi 212, Bi 213 with a C- or above in each section.. Corequisite: Bi 387L.

## Bi 387L-Vertebrate Zoology Lab (0)

Lab for Bi 387.

## Bi 388-Microbiology Techniques (2)

Techniques in microbiology, including staining and microscopy, is olation and maintenanceofbacteria, counting techniques, and methods for a wide range of physiological and morphological tests.

Prerequisite: Bi 235 , or 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 - Selected Topics (0-12)

Consent of 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, physiological, and social variables will be examined in relation to the behavior of the individual animal. Expected preparation:upper-division standing.

Also offered for graduate-levelcredit as $\operatorname{Bi} 512$ 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.. Corequisite: Bi 413 L .

## Bi 413L-Herpetology Lab (0)

Lab for Bi 413 Herpetology.
Corequisite: Bi 413.

## Bi 414-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.

Prerequisite: Completion of Bi 211, Bi 212 , $\operatorname{Bi} 213$
with a C- or above.. Corequis ite: Bi 414 L .

## 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 $\operatorname{Bi} 211, \operatorname{Bi} 212$, Bi 213 with a C- or above in each section.. Corequisite: Bi 415L.

## 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 ofmarine 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: Bi 416 L .

## Bi 416L-Marine Mammal Lab (0)

Lab for Bi 416 Marine Mammals.
Corequisite: Bi416.

## Bi 417 -Mammalian Physiology (4)

Phys iology of the mammalian cardiovascular, respiratory, renal and digestive systems with
emphas is onhomeostatic control and integration of these systems in normal and pathophysiological states.

Also offered for graduate-level credit as $\operatorname{Bi} 517$ and may be taken only once forcredit. . Prerequisite: Completion of Bi 320 with a C- or above..

## Bi 418-Comparative Animal Physiology (4)

Phys iology ofmetabolic, respiratory, circulatory, excretory, muscle, and nervous systems with emphas is 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 3.5hour laboratory periods.
Also offered for graduate-level credit as $\operatorname{Bi} 519$ and may be taken only once for credit. . Prerequis ite: 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 themedical aspects 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. . Prerequis ite: Bi 334 with a C- or 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, organization of the genetic material, and the regulation of gene action.
Also offered for graduate-levelcredit as Bi 524 and may be taken only once for credit. . Prerequis ite: Bi 334.

## Bi 425 -Natural History of Antarctica (5)

Evolution and systematics of the Antarctic and subAntarctic flora and fauna, physiological adaptationto
an extreme environment, conservation concerns and the his tory 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 425 L .

## Bi 425L-Natural History of Antarctica Lab (0)

Lab for Bi 425.
Corequisite: $\operatorname{Bi} 425$.

## 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 forcredit.. Prerequis ite: 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 us ing the $R$ programming language.
Also offered for graduate-level credit as $\operatorname{Bi} 527$ and may be taken only once forcredit. . Prerequisite: Bi 341 and Bi 358.

## Bi 428 - Human Genetics (4)

The organization of the human genome, pedigree analys is, gene mapping, chromosome abnormalities, sex determination, and genedefects (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. . Prerequisite: 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: $\operatorname{Bi} 341$, $\operatorname{Bi} 357$, $\operatorname{Bi} 387$, $\operatorname{Bi} 426$.

Also offered for graduate-level credit as $\operatorname{Bi} 529$ and may be taken only once forcredit. .

## Bi 430 - Theory of Recombinant DNA Techniques (4)

Lectures on theprinciples and theory of recombinant DNA and molecular cloning techniques. Topics will coveruse of restriction and other DNA modifying enzymes, host-vector systems, DNA fragment and plasmid isolation techniques, genemapping, 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 $\operatorname{Bi} 530$ and may be taken only once forcredit. . Prerequisite: Bi 334.

## Bi 431 - Advanced Molecular and Cell Biology Research Laboratory (2)

Laboratory using recombinantDNA and molecular cloning techniques applied to currentresearch projects. Presentations and discussions ofscientific literature.

Also offered for graduate-level credit as Bi 531 and may be taken only once forcredit. . 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 from an evolutionary point of view. Two 2-hour lectures and one 3-hour laboratory.

Also offered for graduate-level credit as Bi 532 and may be taken only once for credit. . Prerequisite: Bi 341 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 forcredit. . Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above..

## Bi 434 - Plant Anatomy (5)

Structure of meristems, cells, tissues, and tis sue 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 $\operatorname{Bi} 534$ and may be taken only once forcredit. . 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 analys is 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 forcredit. . Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above.. Corequisite: Bi435L.

## Bi 435L-Plant Sys tematics 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 forcredit. . Prerequisite: Completion of Bi 320 with a C- or above.

## Bi 437 - Physiological Adaptations to Extreme Environments (3)

Cellular, biochemical and physiologicaladaptations that allow animals to thrive in the Earth's harshest habitats with a focus on what makes species from extreme environments unique.

Also offered for graduate-level credit as Bi 537 and may be taken only once forcredit.. Prerequis ite: Completion of Bi 320 with a C- or above..

## 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) associations. Prior completion of Bi 330 recommended.

Prerequisite: Bi 211 and Bi 212.

## Bi 440 - Evolutionary Medicine (4)

An introduction to evolutionary 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.. Prerequis ite: 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. . Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above.. Corequisite: Bi 441 L .

## Bi 441L-Plant Physiology Lab (0)

Lab for Bi 441.
Corequisite: Bi 441.

## Bi 442 - Plant Physiology (3)

Biochemicalactivities of plants, photosynthesis, and respiration. Course is intended to be taken in sequence with Bi 441 . Expected preparation: Bi 441 .

Also offered for graduate-levelcredit 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-levelcredit as $\operatorname{Bi} 547$ and may be taken only once for credit.. Prerequisite: Upper-divis ion standing.

## Bi 450 -Phylogenetic Biology (4)

The history of life's divers ification through the use of phylogenetic trees, with a focus onhow genes, organisms, and traits have evolved. Includes handson computer analyses of DNA sequences.
Also offered forgraduate-levelcredit as $\operatorname{Bi} 550$ and may be taken only once for credit. . Prerequis ite: Bi 358 with a C- or 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; dysregulated cell cycle, apoptosis, and senescence; angiog enesis; and altered cellularadhesion. Expected preparation: one quarter of Organic Chemrecommended.
Also offered for graduate-level credit as Bi 552 and may be taken only once forcredit.. 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 forcredit. . Prerequisite: Completion of Bi 211 , Bi 212 , and Bi 213 with a Cor 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 organisms develop from a 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.. Prerequis ite: Bi 336 and Bi 341.

## Bi 460 - Marine Biology of the Deep Sea (4)

The deep sea is the largest, but least well-known, living space on the planet. This upper-division Biology majors course provides students with indepth knowledge of deep sea, its inhabitants and their diverse life history strategies, and the anthro pogenic factors shaping the deep seaas we know it. Classes will alternate between lectures and student-led discussions. Students will be expected to have knowledge of general biology prior to thestart of the course.
Prerequisite: Bi 211, Bi 212 , and Bi 213. Concurrent enrollment is allowed only for Bi 213 ..

## Bi 462 - Neuroscience I: Physiology of synapses and circuits (4)

Presents a study of the sophis ticatedelectrical 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 the cellular and molecular biology of neurons will serve as the foundation for the understanding of activity dependentcircuit formation and brain development.
Also offered for graduate-level credit as Bi 562 and may be taken only once for credit. .Prerequisite: Completion of Bi 320 with a C- or above or concurrent enrollment.

## Bi 463 - Neuroscience II: Sens ory and Motor Systems (4)

Explores movement and the mechanisms by which organisms transduce, encode, andultimately perceive information from both the external and internal environment. Topics: Touch and Proprioception, Pain, Vision, Auditory System, Vestibular System, Chemical Senses, LowerMotorNeuron Circuits and Motor Control, Upper Motor Neuron Control ofthe Brainstemand Spinal Cord, Modulation of Movement by the Basal Ganglia, Modulation of Movement by theCerebellum, VisceralMotor System. Expected preparation: Bi 462.
Also offered for graduate-level credit as Bi 563 and may be taken only once forcredit. .Prerequisite: 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 dynamics. 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 proper field 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 forcredit. .Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above.. Corequisite: Bi 472 L .

## Bi 472L-Lab for Bi 472 (0)

Lab for Bi 472.
Corequisite: 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 forcredit.. 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 interspecific 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. . Prerequisite: Bi 357.

## Bi 476L-Population Ecology Lab (0)

Lab for Bi 476.

## 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 andevolution of vegetative growth and flowering. Three hours of lecture and 5 hours oflab per week; there are 2 mandatory field trips.

Also offered for graduate-level credit as Bi 579 and may be taken only once forcredit.. Prerequisite: Successful completion of Bi 330 with a C - or better..

## Bi 481-Microbial Physiology (3)

Physiology and biochemistry of microorg anisms. 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 graduate-level credit as Bi 581 and may be taken only once forcredit. . Prerequisite:

Completion of Bi 211, Bi 212, Bi 213 with a C- or above..

## Bi 486 - Pathogenic Bacteriology (4)

Study ofbacteria pathogenic to humans and their relationship to infectious disease. Emphasis on the biochemicalmechanismofinfection and laboratory diagnosis.

Also offered for graduate-level credit as Bi586 and may be taken only once for credit. . Prerequisite: Bi 380.

## Bi 487 - Immunology and Serology (4)

Topics include thetissues and cells of the immune system, discrimination between self vers us foreign antigen, the structure, function and genetics of antigen receptors, components and coordination between innate and adaptive responses, and dis ease response and susceptibility.
Also offered for graduate-level credit 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 Phys iology Laboratory (1)

Application of the principles of microbiology in the laboratory. One 3-hour laboratory period. Expected preparation: concurrent with Bi481/581.

Also offered for graduate-levelcredit as Bi 589 and may be taken only once for credit. .

## Bi 501 -Res earch (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-SelectedTopics 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: oneyear 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-level credit 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 emphas is on homeostatic control and integration of these systems in normal and pathophysiological states.

Also offered for undergraduate-level credit as Bi 417 and may be taken only once for credit..

## Bi 518-Comparative Animal Physiology (4)

Physiology ofmetabolic, respiratory, circulatory, excretory, muscle, and nervous systems with emphas is on a comparative ecological approach.

Also offered for undergraduate-level credit as Bi 418 and may be taken only once for credit..

## Bi 519 - Animal Physiology Laboratory (4)

Laboratory experiments on the physiology of animals from the cell through organismic levels. Two 3.5hour laboratory periods.
Also offered for undergraduate-level credit as Bi 419 and may be taken only once for credit..

Bi 520 - Ethical Practice in the Life Sciences (3)
Addresses issues 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 misconduct. Satis fies NSF and NIH requirements for research ethics training. Open to graduate students in Biology, Chemistry, and Environmental Sciences. Post-bac students not currently enrolled in a graduate program may take this course with departmental approval.

## Bi 521 - Virology (4)

Classification,structure, genetics, molecular biology of replication, cellinteractions, and hostresponse of representative groups of bacterial, plant, and animal viruses, and themedical aspects of importanthuman 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 anddatabases 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 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 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, organization of the genetic material, and the regulation ofgene 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.. Corequis ite: Bi 525 L .

Bi 525L-Natural History of Antarctica Lab (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 ofhistorical 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-level credit 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 humangenome, pedigree analys is, gene mapping, chromosome abnormalities, sex determination, and genedefects (metabolic and hemoglobin). Topics are discussed fromthe pointof view of clinical applications and current research.

Also offered for undergraduate-level credit as Bi 428 and may be taken only once for credit. . Prerequisite: Bi 341. .

## Bi 529-Conservation Biology (4)

Examination of the principles of conservation biology and applications oftheory to conservation is sues, globally and in the Northwest. Expected preparation: Bi 341, Bi 357, Bi 387, Bi 426.

Also offered for undergraduate-level credit 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 molecularcloning techniques. Topics will coveruse of restriction and other DNA modifying enzymes, host-vector systems, DNA fragment and plasmid isolation techniques, genemapping, subcloning techniques, in vitro mutagenesis, cDNA and genomic cloning, screening of clones, blot hybridizations, DNA transfection anduse of reporter genes, DNA sequencing and PCR.

Also offered for undergraduate-level credit as Bi 430 and may be taken only once for credit. .Prerequisite: Bi 334 .

## Bi 531 - Advanced Molecular and Cell Biology Res earch Laboratory (2)

Laboratory using recombinantDNA and molecular cloning techniques applied to current res earch projects. Presentations and discussions ofscientific literature.

Also offered for undergraduate-level credit as Bi 431 and may be taken only once for credit. . Prerequis ite: 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 from an evolutionary point of view. Two 2-hour lectures and one 3 -hour laboratory.

Also offered for undergraduate-level credit as Bi 432 and may be taken only once for credit.. Corequisite: Bi 532L.

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 ofmeristems, cells, tis sues, and tis sue systems or roots, stems, leaves, flowers and fruits from the 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 analys is and current hypotheses regarding angios permphylogeny 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 from extreme environments unique.

Also offered for undergraduate-level credit 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 potentialapplications and will gain an understanding of how different plant traits functionally interact including positive (defense syndromes) and negative (tradeoffs) associations. Prior completion of Bi 330 recommended.
Also offered for undergraduate-level credit as Bi 438 and may be taken only once for credit.. Prerequisite: Bi 211 and Bi 212..

## Bi 540 - Evolutionary Medicine (4)

An introduction to evolutionary 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-level credit 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-level credit as Bi 441 and may be taken only once for credit.. Corequis ite: Bi 541L.

## Bi 541L-Plant Physiology Lab (0)

Lab for Bi 541.
Corequisite: $\operatorname{Bi} 541$.

## 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-level credit as Bi 442 and may be taken only once for credit. .

## Bi 543 - Advances in Plant Physiology (3)

Lectures and dis cussions 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 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 curriculum design and delivery as well as engage with education research literature.

Also offered for undergraduatecredit as Bi 447 and may be taken only once forcredit.. Prerequis ite: Graduate-level standing.

## Bi 550 - Phylogenetic Biology (4)

The history of life's diversification through the use of phylogenetic trees, with a focus onhow genes, organis ms, and traits have evolved. Includes handson 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: Bi 334, Bi 336, Bi 341, one quarter ofOrganic Chem recommended..

## 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 prerequis ites: Bi 336 or biochemistry, Bi 487.

## Bi 555 -Histology (6)

Systemic study, description, and identification of his tological 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 from a 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 undergraduate-level credit as Bi 456 and may be taken only once for credit. . Prerequisite: Bi 336 and Bi 341..

## Bi 562 - Neuroscience I: Physiology of Synaps es and Circuits (4)

Presents a study of the sophisticated electrical and chemical signals used by cells of the brain to coord inate and dis seminate information about the body and its environment. This working knowledge of the cellular 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-level credit as Bi 462 and may be taken only once for credit..

## Bi 563 - Neuroscience II: Sens ory and Motor Systems (4)

Explores movement and the mechanisms by which organis ms transduce, encode, andultimately perceive information from both the external and internal environment. Topics: Touch and Proprioception, Pain, Vision, Auditory System, Vestibular System, Chemical Senses, LowerMotor NeuronCircuits and Motor Control, Upper Motor Neuron Control of the Brainstemand SpinalCord, Modulation of Movement by the Bas al Ganglia, Modulation of Movement by theCerebellum, Visceral Motor System. Expected preparation: Bi 462.

Also offered for undergraduate-level credit 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 adap tation and community dynamics. One 3-hour laboratory period.
Also offered for undergraduate-level credit as Bi 471 and may be taken only once for credit. . Corequisite: Bi 571L.

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-level credit as Bi 472 and may be taken only once for credit.. Corequis ite: 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 Bi473 and may be taken only once for credit..

## Bi 576 - 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 interspecific 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 undergraduate-level credit as Bi476 and may be taken only once for credit. .

Bi 576L-Population Ecology Lab (0)
Lab for Bi 576.

## 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 vegetative growth and flowering. Three hours of lecture and 5 hours of lab perweek; there are 2 mandatory field trips.

Also offered for undergraduate-level credit as $\operatorname{Bi} 479$ and may be taken only once for credit.. Prerequisite: Successful completion of Bi 330 with a C- or better..

## Bi 581 - Microbial Physiology (3)

Phys iology 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-level credit 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, anaerobic systems, mechanisms of pathogenicity, and the exploitation of microorganisms to generate products for mankind. Expected preparation: Bi380.
Also offered as Bi 685 and may be taken only once for credit. .

## Bi 586 - Pathogenic Bacteriology (4)

Study ofbacteria pathogenic to humans and their relationship to infectious dis ease. Emphasis on the biochemical mechanismof infection and laboratory diagnosis.

Also offered for undergraduate-level credit as Bi 486 and may be taken only once for credit. . Prerequisite: BI 480 .

## Bi 587 - Immunology and Serology (4)

Topics include thetissues 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 res ponses, and dis ease response and susceptibility.
Also offered for undergraduate-level credit 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-level credit as Bi 489 and may be taken only once for credit. .

## Bi 590 - Advanced Comparative Physiology (4)

Advanced topics and current research on various aspects of comparative physiology. Expected preparation: Bi 417 or Bi 418 and Bi 419 .
Also offered as $\operatorname{Bi} 690$ 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, andbehavior. Expected preparation: Bi 416.

Also offered as $\operatorname{Bi} 692$ and may be taken only once for credit. .

## Bi 595 -Advanced Topics in Genetics (2)

New developments in genetics. Topics to include current research in the areas of genetics, human genetics, evolutionary genetics, and molecular genetics. 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 $\operatorname{Bi} 696$ 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 Res earch 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, res earch 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 $\operatorname{Bi} 698$ 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, mechanisms of pathogenicity, and the exploitation of microorganis ms to generate products for mankind. Expected preparation: Bi380.

Also offered as Bi 585 and may be taken only once for credit. .

## Bi 690 - Advanced Comparative Physiology (4)

Advanced topics and current research on various aspects of comparative physiology. Expected preparation: Bi 417 or $\operatorname{Bi} 418$ and $\operatorname{Bi} 419$.
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 include current 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 Res earch 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. andPh.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, A frican American, A froLatin@ and Caribbean studies and the historical and theoretical underpinnings ofblack studies and inter? and multidisciplinary fields of study.

## BSt 203 - African American His tory I - Slavery to the Harlem Renaiss ance (4)

Historical foundations of African Americans in the New World focusing on significantevents and eras including slavery, the Civil War, Reconstruction, and the Harlem Renais sance. This is the first course in a sequence oftwo: 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 AfroLatin@.Specialattentionwillbe given to issues in the creation of multicultural society, such as the dynamics of resistance 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 diasporic 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 A frican continent, the course will cons ider therise of complexsocieties, indigenous African towns, agricultural and technological achievements, A frican state systems, and the impact of international trade and Is lamon Africa.

## BSt 214 - Contemporary Race and Ethnic Relations (4)

Addresses the origins and manifestations of the socio-historical concept of race. Criticaltheory approach is used to analyze the manner in which race has been interpreted and its influence on the sociopolitical 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.

## BSt299-Special Studies (1-4)

(Credit to be arranged.)

## BSt302U-The Contemporary African American Experience (4)

Survey course on the A frican American experience in the 20th and 21st centuries, including social conditions, family, economics, legal cases, race relations, arts.

## BSt 304 - The Civil Rights Movement (4)

Covers the history of the Civil Rights Movement from its early days during WWII through the end of the 1960s. Explores the social, political, economic, and legal challenges, movement leaders, organizations, movementres ources, key movement events, and the role of the media and U.S. government.

Prerequis ite: BSt 202 or BSt 203..
BSt305U - African His tory, Before 1800 (4)
Surveys the history of the African continent from the period of European exploration to the eveof colonialism. Examines impact of the European presence on 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.

## BSt 306U - African History, 1800-Present (4)

Survey the history 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 for credit.

Prerequisite: BSt 211.. Cross-Listed as:Hst 313U.

## BSt 316 - Is s ues in African American Education

(4)

The U.S. education systems and African-Americans. An his torical overview and contemporary analysis 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 res earch 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 is sues, family formations, racism, community organizing, welfare and economic security.

## BSt 319U- Traditional Cultures of Africa (4)

Examines features of A frican 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: Anth 319U.

## BSt325U- 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 social class and an exploration of how Blackness is contested in the media.

## BSt326U- 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 res is tance, nation building and creative identitymaking.

## BSt335U- 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 thehistorical 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 sciencefiction.

## BSt 342 U - Black Feminism/Womanism (4)

Historical evolution of black feminist theory from slave narratives to contemporary manifestations of black feminism including hip hop feminism. Feminist
resistance in the context of race and gender. Analysis of the pluralismwithin black feminism including black lesbian feminism, womanist theology, and radicalblack 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 from the 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 A frican women in cinema using selected films from African and African American, traditional Hollywood films and films by A frican filmmakers. Approaches in comparative analyses of African films are used to examine depictions of African women in traditional and contemporary cultural settings through dis cussions and reviews.

## BSt356U- Cuban Film: Politics and Culture (4)

Topics in Cuban history, culture, race, gender, and politics, focusing on theimpact 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)

Historical and contemporary diversity of A froCreole 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, trans national, globalized Afro-Caribbean society.

## BSt359U- 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 A frican descent living in Europe. The methodology will be based on a social, cultural and historical analysis.

## BSt362U- African Prehis tory (4)

Methods, sources of evidence, and the results of the study of prehistoric cultures of Africa from the earliest traces until the first written records; it includes human origins (physical and cultural evolution), the earliestcivilization, 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 relevanceof A frican cinema are examined from global perspectives and approaches to film analys is and interpretations; the impact and contributions to understanding African cultures are discussed.

## BSt 372 U-Post-colonial Studies of Africa (4)

Study of the social, political, and economic dimensions of imperialismin twentieth century Africa from the pers pective of post-colonial studies. This is the same course as Intl372U and may be taken only once forcredit.
Cross-Listedas: This is the same course as Intl372U and may be taken only once for credit..

## BSt 377U- Vodoun, Rasta and Islam in the African Diaspora (4)

His torical and cultural background on how Voudun, Is lam, and Rastafarianismbecame 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 philos ophical 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 categories of race to the persistence of racism.

## BSt 384U- 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 clas sical 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 - Res earch 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, interv iewing, content analysis, archival research, library research, Internet res earch, and participantobservation.

Prerequisite: BSt 202, BSt 203, BSt 204 or BSt 206 and upper-division standing..

## 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.)

## BSt406-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 409U- Practicum(4)

(Credit to be arranged.)

## BSt 410 -Selected Topics (1-6)

See department for course description. (Credit to be arranged.)

## BSt 411 - African American History Seminar (4)

In-depth analysis of criticaltopics and issues in African American his tory. 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 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 Oregon history. Topics include thes lavery controversy in early Oregon development, contributions of blacks to the growth of the state, black migration during W orld War II, the Vanport flood, and various legislative actions related to black status in Oregon.
Prerequis ite: Junior or seniors tatus or permis sion from the instructor..

## BSt 413 - Slavery (4)

An examination of the role ofs lavery in establishing and reinforcing thestatus 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 slavesystems and the impact of slave rebellions.
Prerequisite: BSt 202, BSt 203, BSt 206 and BSt 214.

## BSt 414 -Racism (4)

Survey of the social-psychological, pseudo-scientific, and biological literature and their impact on individualand cultural forms of racismin 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 Punis hment (4)

Examination of historical and contemporary incarceration in the U.S. including slavery, Reconstruction, and JimCrow 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 permission of the chair.. Corequisite: NA.

## BSt419-African American Women in America (4)

Designed to investigate the evolution of the A frican 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 social justice.
Prerequisite: BSt 207.

## BSt 420 - Caribbean Literature (4)

A selection of poetry and fiction from the English and French speaking Caribbean (in translation where neces sary).
Prerequisite: One previous African American literature course and 12 additional literature credits..

## BSt 421 - African American Writers (4)

Examination of significant A frican 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, is sues and characterization during the decade of the 1970s in the cinema industry. Particular attention on the genre of the Blaxploitation film as an industry res ponse to the rapidly shifting social and racial dynamics 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. Particular attention 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, Frantz Fanon, Albert Memmi, BookerT. Washington, 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: Upper-divis ion standing..

## BSt 440 - Caribbean Studies (4)

Interdisciplinary examination of historical or cultural is sues in the Caribbean experience. Emphasis will be on is sues and dilemmas related to the creation of a multiculturalsociety.
Prerequisite: BSt 206 or BSt 211.

## BSt444-Food Justice (4)

Food justice is studied from a 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 foodjustice class, we study the historic background and diversity of A fro 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 His tory And Culture (4)

In-depth exploration of selected topics in African and/or Caribbean cultural history. Specialattention will be given to thematic is sues of broad application to the understanding of cultural interaction, 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 responses. 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 forcredit.. Prerequisite: Prerequisites: Two courses in BSt or permission from the department chair..

## BSt 467 - African Development Issues (4)

An examination of the causes of poverty and underdevelopment of the African continent. A comparative analysis of pre-colonial, colonial and post-colonial circums tances 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 org anization, ghettos as colonies, citizen participation, change agents, planning, and social change implications. Expected preparation: BSt 202, BST 203, or BSt 204 or course in Blackhistory and culture.

Prerequisite: Junior or seniors tatus..

## BSt489-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. Through examining 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 forcredit.. Prerequisite: Upper-division standing..

## BSt502 - Independent Study (1-9)

(Credit to be arranged.)

## BSt505-Reading and Conference (1-8)

(Credit to be arranged.)

## BSt506-Overs eas Experience (1-8)

Community-based learning in an international context through immers ion 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 admission to the overseas programs is required..

## BSt507-Seminar (1-6)

See department for course description. (Credit to be arranged.)

## BSt509-Practicum(1-9)

(Credit to be arranged.)

## BSt510 - SelectedStudies (1-6)

(Credit to be arranged.)

## BSt511 - African American History Seminar (4)

In-depth analysis of critical topics and issues in African American history. The content of the course is topical ratherthan 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 for credit.

Also offered for undergraduate-level credit as BSt 411.. Prerequisite: BSt 202 or BSt 204 and junior or senior status..

## BSt512 - Oregon African American History (4)

Examination of the black experience in Oregon history. Topics include the slavery controversy in early Oregon development, contributions of blacks to the growth of the state, black migration during W orld 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 thestatus and position of the black population in the U.S. and the Caribbean, including physical and psychologicalimpacts, 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..

## BSt514-Racism(4)

A survey of the pertinent social-psychological literature on individual and cultural forms of racism in America. The rationalizations, processes and machinery of oppression as constructed by white European and American governments which control and exploit the resources 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.

BSt520 - 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..

## BSt521 - 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 ofthe period are included with special consideration 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..

## BSt522 - 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..

## BSt525-Black Cinema: the 1970s (4)

Examination of the treatment ofBlack themes, is sues 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 treatmentofBlack themes, issues, and characterization in the contemporary cinema industry. Particular attention will be focused on the development ofnew 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..

## BSt530 - Black Political Thought (4)

Theories of Black nationalism, including the political thought of Martin Delany, Aime Cesaire, Frantz Fanon, Albert Memmi, Booker T. Washington, 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: Upper-divisionstanding..

## BSt 540 - Caribbean Studies (4)

Interdisciplinary examination of historical 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/orCaribbean cultural history. Special attention will be given to thematic is sues 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 Black Panther Party. Analysis ofthe 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: Prerequis ites: Two courses in BSt or permission from the department chair..

## BSt567-African Development Is sues (4)

An examination of the causes of poverty and underdevelopmentof the African continent. A comparative analysis 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 juniororsenior status..

## BSt589-Afro-Latin@ Narratives (4)

This course explores through poetry, songs, music, stories, (auto)-biographicalaccounts and novels the creativity and meaning produced by people of African descent living in or from Latin America. Through examining the narrative expressions 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: Upper-divisionstanding..

## Bsta - Biostatistics

Courses offered as part of the joint OHSU-PSU School of Public Health.

## Bsta 511 -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 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 one- and two-sample tests of population means and tests of independence for two-way tables. Students will be introduced to one-way analysis of variance (ANOVA), correlation, and simple linear regression. The course focuses on understanding when to use basic statistical methods, how to computetest 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 packages, 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 PreventiveMedicine, and BSTA 612 for PhD students fromBehavioral 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. Forstudents of BSTA 612, extra homework problems and reading materials will be assigned along with one
extra week of lecture on mixed-effects models for longitudinal/repeared measure data.

Also offered as Bsta 612 for doctoral students..

## Bsta 513 - Categorical Data Analysis (4)

Categorical 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 as sess 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 Poisson 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 ofstatistical 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 proportional hazards regression model is presented in detail, along with some extensions of this model. As time allows, other topics will be introduced including parametric survival models, frailty models and/or models incorporating competing risks. Power and sample size computations for time-to-event data will also be introduced. Most assignments will be completed us ing statistical computing soft ware. Contextualizing results in the context of health sciences problems and research questions is stressed throughoutthe course.

Prerequisite: A standard pre-calculus course in probability \& statistics (e.g. Bsta 511), a course in applied linear regressionmodels (e.g. Bsta 512)..

## Bsta 515 -Data Management \& Analysis in SAS

 (3)This course is designed for students 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 Microsoft Excel. Students will have chance to build their analysis skills from basic 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 managedata, perform analyses and producegraphs. Class sessions and homework will be oriented around particular data management and analysis tasks. Health-related data sets will be provided for students to practice. This course could be extremely helpful in preparation for thesis, capstone or other res earch projects.

## Bsta 516 - Design and Analysis of Surveys (3)

This course is designed to introducebasic concepts, techniques, and current practice of sample survey design and analysis. Specific topics covered include introduction to statistical sample design, such as simple randoms ampling, systematic sampling, stratified randomsampling, cluster sampling, multistage sampling. Complex des igns will also be included. Topics in estimation and analysis 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 discussed in the course include introduction to clinical trials, fundamentals of Bayesian statistics, sample 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, adaptiveclinical trial design and designs for predictive biomarkers.

## Bsta 518 -Spatial Data with GIS (3)

Geographic information system(GIS) software is a powerfultool for assessment, 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 natural environment. The course will also cover basic statistical methods for the analysis 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 basic applied statistical courses and wish to learn the more advanced statistical methods for longitudinal data. Longitudinal data consistof measurements of response variables at two or more points in time for many individuals. This course covers the statistical properties oflongitudinal 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, thecourse will briefly mention the traditional repeated meas ure analysis 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 assignments and final class project play a central role to understand and appropriately apply themethods covered in the course.

Prerequisite: Bsta 511, Bsta 512, and Bsta 513..

## Bsta 521 -Bayesian Methods for Data Analysis (3)

This course is an elective course for students 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 on the "frequentist" method ofstatistical 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 ALL information known at the time. Bayesian methods for data analysis enable one to combine information from previous similar and independent
studies (prior information), with information froma new study, y ielding updated inference formodel parameters. This course will cover the concept of Bayesian analysis, posterior distribution, Bayesian inference and prediction, prior determination, one parameter and two parameter models, Bayesian hierarchical models, Bayesian computation, model criticism and selection as well as basic comparis on of Bayesian and FrequentistInferences. Real life examples in medical and health science will be used to explain the conceptand 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 forstatistical 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 increasingly becoming crucial in data science. Ever-increasing data complexity and unconventional data create new challenges for traditional statistical learning, and this is an active research area. This course will cover traditional 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 analysis ofbiological/clinical data from various experiments. This course provides not only theoretical aspectofexperimental des ign but also hand-on experience in des igning and analyzing experiments. The course begins design principles that include concepts of replication, randomization, blocking, multifactor studies, and confounding. Basic matrix algebra concepts will be explored to establish the bas is for linear models. Students, then, are introduced to various experimental designs including analys is of variance (ANOVA) in both single and multi-factorial setting, experiments to study variances, complete/incompleteblock designs (CBD), split plot design, repeated measures ANOVA, analys is of covariance (ANOCOVA), response surface design, and diagnosing agreement between the data and model. The course also provides experience in analyzing unbalanced experimental. Computer application is included as part of the course to 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 platformforgenomic studies. Due to the high dimens ionality of NGS, it provides unique challenges in statistical analysis and requires differentstatistical methods. Although NGS data are the main focus, the theory and methods are applicable to other high dimensional data such as microarray and proteomics. This course will cover statistical theory and methods specialized forNGS 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 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 displays and numerical measures will be discussed. Bas ic 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 relevantsituations. 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 interpretresults. Computer applications (using statistical software) are included as part of the course.

Prerequisite: Graduate standing..

## Bsta 530 - Bios tatistics Lab (3)

The course provides hands-on data analysis and/or biostatistical consulting experience to students outsideclas sroom settings. Students will have opportunities to perform data analysis with inputs from faculty members. Students should have adequate skills in at least one statistical program among STATA, SAS or R and finishedBSTA 512 Linear Models or equivalent. Students meet weekly for 1~2 hour with the course instructor for discussion on their projects and are required to have regular meetings with an as signed faculty advisor and/or consultee(s), if applicable. Students are expected to work individually or in a team of $2 \sim 3$ on actual data analys is. 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 analysis).

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 random variables, probability distributions, joint distributions, expectation, transformations of randomvariables, 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 ofdatareduction and estimation(frequentistand Bayesian methods). We will also introduce hypothesis testing, time permitting. The two courses must be taken in sequence.
Prerequisite:Bsta 550 and differential and integral calculus..

## Bsta 552 - Statistical Inference II (3)

Statistical inference II is the second of a two term course (BSTA 551 \& BSTA 552) and provides theoretic foundation in biostatistics. Topics in the second course will include sampling distributions, point and interval estimation, tests ofhypotheses, and an introduction to asymptotic 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 displays and numerical measures. Bas ic probability concepts will be explored to establish the basis for statisticalinference. 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 one- and two-sample tests of population means and tests of independence for two-way tables. Students will be introduced to one-way analysis of variance (ANOVA), correlation, and s imple linear regression. The course focuses on understanding when to use basic statistical methods, how to computetest
statistics and how to interpret and communicate the results. Computer applications are includedas part of the course to introducestudents to basic data management, reading output fromcomputer packages, 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 fromBehavioral Neuroscience or other PhDprograms. 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. Forstudents of BSTA 612, extra homework problems and reading materials will be assigned along with one extra week of lecture on mixed-effects models for longitudinal/repeared measure data.

Also offered for graduate-level credit as Bsta 512..

## Bsta 613 - Categorical Data Analysis (3)

CategoricalData 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 as sess confounding and interaction via stratified tables. Students will learn log is tic 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 assessment. Students will have the opportunity to be exposed to other analysis methods, such as Poisson 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 forcredit..

## 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 ofNGS, it provides unique challenges in statistical analysis and requires differentstatistical methods. Although NGS data are the main focus, the theory and methods are applicable to otherhigh dimensional data such as microarray and proteomics.

This course will cover statistical theory and methods specialized forNGS 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 use of business scenarios, students develop the skills to structure decision making and as sess their findings. Using datasets from industry, 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 theseanalyses, and the useof Excel \& Tableau.
Prerequisite: BA 327.

## BTA 380 - Data Communications (4)

Topics include communication between people and machines, transmis sion 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 is sues covered include cost/benefit analys is, org anizational impact, international systems, and emerging technologies.

Prerequisite: BA 325, CS 106..

## BTA 401 - Res earch (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 systems, 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 professional activities away from campus.

Prerequis ite: 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 analysis, 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 practice of successful design, development and implementation ofdatabases.

Prerequisite: BA 327.

## 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, eventdriven 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. Emphas is 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 development of
interactive business analytics using Python. Students will learn how to use the principles of programming, especially in Python to develop applications for business.

Prerequisite: BA 327.

## BTA 420 - Systems Analys is and Design (4)

Introduces the foundations of systems analysis and design (SAD). It examines the scope and organization of the systems development process and the role of the systems development professional. Topics include systemrequirements, systemanalysis, process and data modeling, implementation, and project management, as well as systems analyst skills and competencies. Standard systemanalysis methods and techniques will be presented and applied. Designed to give you a generalized, portable, and adaptable understanding of the standard SAD 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 professionals on SAD-related is sues.

Prerequisite: BTA 415, BTA 419.

## BTA 424 -LAN Management (4)

Hands-on introduction to the administration of client/server-based local area networks addressing both conceptual and operational aspects ofnetwork operating systemmanagement and client operating systemconfiguration. Topics include: design and implementation ofnetwork directory services and file systems; network security, backup, and recovery; the implementation and control of distributed 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 thetechnologies used in aiding decision making in organizations. In addition to the theoretical aspects of decis ion 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 froman ethical lens. The
theories, concepts, and practices relating to the deploymentandmanagement of information security systems, and the collection and use of data. Topics include threatanalysis 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 420.

## 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 clientserver architecture and data environments such as Oracle and SQL Server. Students will participate in database design projects. Other topics will include industry trends and opportunities, and database administration.
Prerequisite: BTA 415.

## ISQA 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.. 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 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 once for credit.. Prerequisite: This course is part of the Business Blockchain Certificate. All students are expected to complete the Blockchain Primer before registering forthis course..

## BTA 483 - Blockchain in Business (4)

This course explores business uses of distributed ledger technology (DLT), including for transferring value, executing smart contracts, tracking chain of custody, and verify ing identify.

Also offered for graduate-level credit as BTA 583 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 forthis course..

## BTA 484 - Blockchain in Business Lab (2)

This course provides extensive hands-on practice using dis tributed ledger technologies and discussions about the appropriate uses of relational databases and various permissioned and permissionless blockchain systems.
Also offered for graduate-level credit as BTA 584 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..

## 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 for credit.. Prerequisite: This course is part of the Business Blockchain Certificate. All students must complete the Blockchain Primer before 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 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..

## BTA 510 -Selected Topics (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 fromthe on-line Essentials of Bus iness Decision Tools completed prior to admission to theMBA+ 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 analysis.
Prerequisite: Pre-stats online module..

## BTA 514 - Survey Res earch Techniques (1)

Focus on business applications for designing, adminis tering 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 thatincorporate 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 Regres sion with Business Applications (3)

Presents some linear model building and evaluation techniques using multiple regression. The course is organized 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 (4)

Introduction to the role of"big dataanalytics" related to strategic decision making. Exploration of concepts fundamental to analytics programs, including datadriven decis ion making, interpreting and gaining insight fromstructured data, effective communication of strategic decisions, and managing an analytics team.

## BTA 520 - Introduction to Business Intelligence and Analytics (4)

An overview on leveraging dataresources to develop and deploy business strategies to enhance their
decision-making capabilities so organizations can gain and sustain a competitive advantage.
Specifically, the course shows how to dis cover subtle patterns and associations frombus iness dataand develop and deploy predictive, clustering, and market basket models to optimize decision-making throughout organization.

## BTA 521 -Data Vis ualization (2)

An essential component of Business Intelligence/ Analytics is datavisualization. This course prepares students to generate datavisualizations with several standard software applications in analytics, and to interpret and communicate the results to an org anization'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 data stored in a variety of data structures possible in the R language. Students will learn the basics of the R language for data analysis, datavisualization, and data manipulation. Students will expand their skills using R to accomplish applied analyses with business data.

## 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 dis ruptive technology and an important tool in business processes, e.g., sales forecasts, employee retention, inventory control, personalized advertis ements, 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 essential 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. CrossListed 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 essential 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.. Prerequis ite: Blockchain primer or equivalent and admitted to a graduate business program. CrossListed as: This is the same course as BTA 581 and may be taken only once forcredit..

## 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 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-Listedas: This is the same course as BTA 582S and may be taken only once for credit..

## BTA 582S - Block chain 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 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-Listedas: 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 distributed ledger technology (DLT), including for transferring value, executing smart contracts, tracking chain of custody, and verify ing 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 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 smart contracts, tracking chain of custody, and verify ing 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. Allstudents are expected to complete the Blockchain Primer before registering for this course.. Cross-Listedas: This is the same course as BTA 583 and may be taken only once for credit.

## BTA 584 - Blockchain in Business Lab (2)

This course provides extensive hands-on practice using distributed ledger technologies and discussions about the appropriate uses ofrelational databases and various permissioned and permissionless blockchain systems.

Also offered for undergraduate-level credit 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 dis tributed ledger technologies and discussions about the appropriate uses of relational databases and various permissioned and permissionless blockchain systems.

Also offered for undergraduate-level credit 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 regis tering for this
course.. Cross-Listedas: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 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-Listedas: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 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.. 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. Allstudents 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 unders tanding 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
reactive function 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 transgress 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 fromthree perspectives: the police officer-citizen interaction, the agencycommunity 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 - Punis hment 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 250 - Criminal Behavior (4)

Examination of psychosocial theories of crime and identification of the individual-level factors as sociated with the onset, continuity, and desistance of criminal behavior in juveniles and adults. Special topics covered include the relationship between mentalillness and violence, psychopathy, sexual deviancy, substance abuse, human aggression, and the rehabilitation of offenders.

## 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 system in America. Examines the law's proactive function in teaching people how to live peacefully within their communities and the law's reactive function 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 fromthree perspectives: the police officer-citizen interaction, the agencycommunity relationship, and the legal and ethical questions of policing in a democratic society. The course considers the his tory 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 dis cussion of theories of punis hment 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 is sues, and best practices for juvenile delinquency prevention and juvenile justice reformare the fociof the course. Students explore identifiers of"at-risk" youths, and the role disproportionate minority contact, poverty, trauma, mentalhealth dis orders, and physical or intellectualdis 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 from communities
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 courtroom participants, 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 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 ofother 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 careful scientific study of frime. 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 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 fromthese 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 setof 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 ourown 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 system; attention is given to the general categories of generaland specific deterrence, aggressive 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 comparison because of political and cultural differences.

## 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 from a numberofsources like police homicide reports, theFBI, 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, psychology must include the study oflaw, which is a primary instrument used by society to control human 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 Leaders hipin Criminal Justice (4)

Ethical leadership is a topic of longstanding theoretical and practical importance for the criminal justice system. Criminal and social justice is sues are deeply embedded in the social fabric of the community and ethical leadership is sues frequently have ramifications beyond the boundaries of our discipline. Students will be taught to recognize, understand, and analyze the significance of ethical leadership for the criminal justice system and the community within which it exists.

## CCJ 355U- Pers pectives on Terrorism (4)

A survey of international and domestic terrorism, the organizations, philosophies, key players, counter-
terror organizations, and response. Investigation of the social, psychological, cultural, historical, 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 discussed 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 assumptions. Explores the connections between critical criminology and social justice, the social justice movement, and the communities wherein social justice is practiced. Application ofsocial justice theory to criminal justice policy and practicehas created a new set ofsocial response mechanisms to crime and delinquency: mediation, restitution, and res torative justice.

## CCJ 370U- Women, Crime, and Justice (4)

Women as criminals, victims, and professionals in the criminal justice system are the focus of this course. Theories, policies, and relevant empirical studies will be discussed in the context of the his torical, 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 druguse.

## CCJ 375 - 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 Res earch (4)

Introduction to the basic concepts of social science research including hypothesis 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 pers ons of respectability and high social status as opposed to traditional "s treet 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) Pass/no pass option.

## CCJ 399U- Special Studies (4)

(Credit to be arranged) Pass/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 instructor.

## CCJ 404 - Cooperative Education/Internship (112)

(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 towardCCJ elective credits required ofmajors. 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 410U- Selected Topics (1-4)

(Credit to be arranged) Consentof instructor. Pass/no pass option.

## CCJ 415 - Counseling Skills for Criminal Justice (4)

A practice-oriented course covering the basic interviewing, assessment, and counseling skills routinely used by professionals in the criminaljustice 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 cris is intervention.

## CCJ 420 - Criminal Law and Legal Reasoning (4)

Study of the basic concepts related to criminallaw, including: historical development, legal elements of crime and proof, defenses and mitigation, reasonable doubt, and presumptions of fact; with particular emphasis on the application of logical reas oning to make legal decisions.
Prerequis ite: 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 problem-solving. Students will work on neighborhood-centered projects to explore solutions to neighborhood crime patterns, dis order, and fear of crime, and ideas for strengthening policecitizen relations, and community building.

## CCJ 480 - Community-bas ed 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 use of volunteers and offenders as correctional manpower resources.

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 clas sification systems, treatment programs, as well as evidence-based theories and approaches to the treatment of offenders. Finally, this course will cons ider how correctional programs should be implemented, monitored and evaluated.
Prerequis ite: Sophomore Standing or Completion of CCJ 200 orCCJ 300..

CCJ 501 - Research (1-9)
(Credit to be arranged) Consentof 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 staffand/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 505-Reading and Conference (1-6)
(Credit to be arranged) Consent of instructor.

## CCJ 506-Projects (1-12)

(Credit to be arranged) Consentofinstructor.

CCJ 507-Seminar (1-6)
(Credit to be arranged) Consentofinstructor.

CCJ 508-Workshop (1-8)
(Credit to be arranged) Consentof 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 socialevents and trends in Western and Eastern civilizations that have influenced crime and the development oflaw, 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 complexrelationship 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, works hops,
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 givento 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 dis cussed 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). Basic techniques commonly used to analyze and presentcriminal justice data are covered with an emphasis on the use of empirical 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 numberofuseful statistical models that move beyond standard linear regression. A mong 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 JusticeTheory (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, organizational, system, and political behavior. Emphasis is placedon 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 Res earch (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 knowledge base 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 Justice Policy (3)

An advanced course in criminal justice policy analys is. 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 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 environmentwithin which thecriminal and quasicriminal justice 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 selectresearch methodologies practiced in criminology and criminal justice. Topics may include, but are not limited to; survey methods, field methods, advanced statistics, advanced crime analys is, content and document analysis, evaluation research, secondary data analysis, and interviews. Topics will vary yearly. May be repeated once.
Also offered as CCJ 645.

## 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 orderto develop practical and applied skills within the field. Students will learn about the interconnections between spatial-temporal theories of crime, and applied crime analys is

## 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 display and dis seminate 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 analysis and Geographic Information Systems (GIS). Students learn es sential principles of cartography and geography, as these fields apply to crime analys is. Participants learn how to collect, clean, geocode, analyze and present spatial crime data.

## CCJ 580 - Community-bas ed Treatment of Offenders (3)

An analysis ofthe 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 use of volunteers and offenders as correctional manpower resources.

## 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 ofstudents are completed by agency staffand/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 ins tructor.

## CCJ 605 - Reading and Conference (1-6)

(Credit to be arranged) Consentof instructor.

## CCJ 606 - Projects (1-12)

(Credit to be arranged) Consentof instructor.

## CCJ 607 - Seminar (1-6)

(Credit to be arranged) Consentof instructor.

## CCJ 608 - Workshop(1-8)

(Credit to be arranged) Consent of instructor.

CCJ 609 - Graduate Practicum(1-8)
(Credit to be arranged.)

## CCJ 610 - Special Topics (1-4)

(Credit to be arranged.) Consent of instructor.

## CCJ 615 - Theories of Crime and Justice (3)

An overview of is istorical, sociological, biological, psychological, economic, and Marxist theories of crime causation. Particular attention is given to analyzing each theory presented in terms of its internalconsistency and logic as wellas its fit with data on crime, criminals, and victims. Students will have to test theeffectiveness 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 ofdata fromvarious sources (e.g., police, courts, corrections). Bas ic techniques commonly used to analyze and present criminal justice data are covered with an emphasis on the use of empirical 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 pers pectives. Topics discussed include examination of the stages of the justice process and theoretical approaches to studying individual, organizational, system, and political behavior. Emphasis is placed on the practicalutilization 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 Res earch (3)

The purposeof 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 knowledge 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 Justice Policy (3)

An advanced course in criminal justice policy analys is. 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 that examines the legal environmentwithin which thecriminal and quasicriminal justice systems function, with particular emphasis on philosophical and 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 repeatedonce.
Also offered as CCJ 541..

## CCJ 645 - Advanced Topics in Research Methods

 (3)Advanced training in selectresearch methodologies practiced in criminology and criminaljustice. Topics may include, but are not limited to; survey methods, field methods, advanced statistics, advanced crime analys is, content and document analysis, evaluation research, 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 justice responses 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 Civiland Environmental Engineering (CEE) through interaction with practicing professionals, upper class mentors, and professors in CEE. This course will cons ider the history, ethical concepts, sustainability issues, 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: CE 111.

## CE 112-Civil and Environmental Engineering Computations (3)

Computational techniques in Civil and Environmental Engineering. Developmentof mathematical techniques to solve engineering problems. Use of statistical and graphical techniques to present engineering 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: CE 112.
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: CE115L.
CE 115L-Civil Engineering Drawing and Spatial Analysis Lab (0)

Lab for CE 115
Corequisite: CE 115.

## 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 measurements 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 plane survey instruments. Field projects in testing instrumental adjustment and executing basic survey circuits. CE 213: 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 sequence of three: CE 212, 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 transportation engineering. Overview of education, training, research, and employment opportunities for each area ofCEE. Engineering registration and ethics.
Prerequisite: juniorstanding in CEE.
CE 321 - CEE Properties of Materials (4)
Introduction to structure and properties ofcivil engineering materials such as steel, asphalt, cement, concrete, soil, wood and polymers. Laboratory tests include evaluation ofbehavior of these materials under a wide range of conditions. Lectures and laboratory.

Prerequis ite: 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 system and 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
displacements and rotations by virtual work, Castigliano's theorem for trusses, beams and frames; computer analysis ofstructures 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 indeterminatestructures by force and displacement methods; consistent deformations and the theorem of least work; slope deflection; moment distribution including sway; approximate methods.

Prerequisite: CE324..

## CE 341 - Soil Classification and Properties (4)

Determination and interpretation ofs ignificant engineering properties and behavior of soils; selected application in mechanics of foundations and earth structures. Three lectures; one 3-hour laboratory period.

Prerequis ite: CE321.. Corequis ite: 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 engineering properties of soils for environmental majors. 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 Trans portation Engineering (4)

A study ofengineering problems associated with the planning and design of urban and intercity transportation with emphasis 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 establishment of design criteria for transportation structures.

Prerequis ite: Stat 451 and junior standing in engineering..

## CE 361 - Fluid Mechanics (4)

Properties of fluid; fluid statics; fluid dynamics; control volume and Reynolds transport theorem; conservation ofmass, momentumand energy; differential analys is; 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 pressurized closed conduits including pipes in series and parallel; turbomachinary including pump systems and turbines; uniformand nonuniformflow in open channels, gradually and rapid varied flow; dimensional analysis and similitude. 3 units lecture and 1 unit laboratory.

Prerequisite: CE361.. Corequis ite: 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 ofair, land, and water pollutants on environment. Transport and fate of pollutants in environment. Flow and mass balances of reactors. Reaction kinetics. Mathematical modeling of water quality in rivers, lakes, and estuaries. Water and was tewater treatment processes. A ir quality management. Solid wastemanagement.
Prerequisite: Ch 222, Ch 228, and CE $361 .$.

## CE 399 - Special Studies (1-6)

(Credit to be arranged.)

## CE 399L- Special Studies Lab (0)

Special studies 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 oflegal issues relevant to civil and environmental engineers, including contract law, environmental law, professional liability/negligence, and property law. This course will consider legal decis ions, statutes and adminis trative rules, and case studies relevant to the practice of civil and environmental engineering.

Also offered forgraduate-levelcredit as CE511 and may be taken only once for credit.. Prerequisite: 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 heatmanagement and minimization, "green vs. "gray" in waste water treatment, and feasibility of energy frombiomass.
Also offered for graduate-level credit as CE 512.. Prerequisite: CE 362 or CE 341 or CE 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 threetimes.

Also offered for graduate-level credit as CE 514.. Cross-Listed 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 CE 516 and may be taken only once for credit.. 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: CE 325.

## 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 AASHTO Load Res is tance Factor Design specifications.
Also offered for graduate-level credit as CE519 and may be taken only once forcredit. . Prerequisite: CE 325.

## 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 forcredit. . 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-level credit as CE 531 and may be taken only once for credit. . Prerequisite: CE 432, 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 CE 532 and may be taken only once for credit. . Prerequisite: CE 321 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 Res istance Factor Design (LRFD) methods of the AISI specification.
Also offered for graduate-level credit as CE 533 and may be taken only once for credit. . Prerequisite: CE 432.

## CE 434 - Principles of Reinforced Concrete (4)

Loads, load factors and structural safety, ultimate strength analysis; 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; lateral loads; laboratory demonstration of beamand column behavior.

Also offered for graduate-level credit as CE 535 and may be taken only once for credit. . Prerequisite: CE 434.

## CE 436 - Mas onry Design (3)

Materials of construction; design ofmasonry elements, lateral load res isting systems, and connections with reference to current codes.
Also offered for graduate-levelcredit as CE 536 and may be taken only once for credit. . Prerequisite: CE 434.

## CE 438 - Design of Composite Structures (4)

Design of composite steel-concrete members based on allowable stress design and load and res istance factor des ign methods.
Also offered for graduate-level credit as CE538 and may be taken only once for credit. . Prerequisite: CE 432.

## CE 440 - Geosynthetics in Infrastructure 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 transportation, structural, and geotechnical disciplines. Use ofgeotextiles, 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 once forcredit. . Prerequisite: CE 444.

## CE 442 - 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 fundamental analytical solution techniques for engineering with soil, the use and limitations of elasticity assumptions. Three lectures, one 3-hour laboratory period.

Also offered for graduate-level credit as CE542 and may be taken only once forcredit. . Prerequisite: CE 341.

## 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 triggering assessment 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 once forcredit. . Prerequisite: CE 341.

## CE 444 - Geotechnical Design (4)

Effect of soil conditions upon the behavior and choice of type of foundation; study of earth pressure theories; design offoundations and earth-retaining structures.

Prerequisite: CE341.

## CE 445-Geo-environmental Engineering with Geosynthetics (2)

Application of polymer-based geosynthetic products for geo-environmental and municipalengineering 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 CE 545 and may be taken only once forcredit. . Prerequisite: CE 341.

## 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 ofmarginal slopes.
Also offered for graduate-level credit as CE 547 and may be be taken only once for credit.. Prerequisite: 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 illus trate how to identify important site parameters within the site data and how these parameters might affect the project design.
Also offered for graduate-levelcredit as CE 548 and may be taken only once for credit.. Prerequisite: 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 pavementmarkings; analyzing data sets for recommendations and prioritization; principles of driver and vehicle characteristics in relation to the roadway.
Also offered for graduate-levelcredit as CE 550 and may be taken only once for credit. . Prerequisite: CE 351.

## CE 454 - Urban Trans portation 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 distribution models, applications and case studies. Route assignment analysis and traffic flow theory.
Prerequisite: CE351.

## CE 458 - Public Transportation Systems (4)

Performance characteristics of public transportation systems, with emphasis on urban systems. Planning, design, and operational is sues related to public transportation systems. Emerging technologies. Expected preparation: CE454.
Also offered for graduate-level credit as CE558 and may be taken only once forcredit. . Prerequisite: CE 351.

## 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; data interpretation; analysis techniques; diagrams; simulation queuing; optimization. Expected preparation: CE 454.

Also offered for graduate-level credit as CE559 and may be taken only once for credit. . Prerequisite: CE 351.

## CE 462 - Traffic Engineering Applications and Signal Timing (4)

Theory and practice oftraffic signal timing. Focuses on terms as sociated with signal timing, relating practice in the field with analys is 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 CE 562 and may be taken only once forcredit. . Prerequisite: CE 351.

## CE 469 - Subs urface Hydrology (4)

Basic principles of aqueous flow in the subsurface, emphasizing the importance of groundwater as a resource. Hydrologic cycle, history of groundwater usage, aquifer classification and properties, Darcy's experiments and Law, hydraulic head and potential, porosity and permeability, transmis sivity and storativity, heterogeneity and aniso tropy, 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 CE 569 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, dis infection, sludge treatment and disposal, advanced waste-water treatment processes.
Also offered for graduate-level credit as CE 574 and may be taken only once for credit. . Prerequisite: CE 371 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 CE 579 and may be taken only once forcredit. . 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 trans formations, and bioaccumulation. Expected preparation: Ch 222.
Also offered for graduate-level credit as CE 580 and may be taken only once forcredit. . Prerequisite: Ch 221.

## CE 481 - The Columbia River as a System(2)

Explores the climate and hydrologic processes that shape the Columbia River bas in ecosystem, and relates these processes to the basin's management context. The geographic scope includes the watershed, the mainstemand 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 present ordiscuss 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-level credit as CE 581 and may be taken only once forcredit. . 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 transport will be briefly introduced.
Also offered for graduate-level credit as CE582 and may be taken only once for credit. . Prerequisite: CE 361 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 frontalpropagation. Expected preparation: CE 576.
Also offered for graduate-level credit as CE 583 and may be taken only once for credit. . Prerequisite: CE 361 and CE 371.

## CE 484-Civil \& Environmental Engineering Project Management and Design I(3)

Engineering design process including owner design, professional-constructor relationships, procurement procedures, project evolution; contracts, dispute resolution, bonds, warranties; construction documents, including specifications; costestimating, planning, and scheduling; construction adminis tration; 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 Design I Lab (0)
Lab for CE 484 Civil Engineering Project Management and DesignI.
Corequisite: CE484.

## CE 485 - Environmental Cleanup and Restoration (4)

Survey of procedures for evaluating risks posed by hazardous wastesites 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 ofmajor environmental is sues: stratospheric ozoneholes 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 for credit.
Also offered for graduate-level credit as CE586 and may be taken only once forcredit.. 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 chemistry in natural water systems: simple-to-complexacid/base chemis try; titration curves; bufferstrength; acid/base chemistry of carbon dioxide in open and closed systems; alkalinity as systemvariable (blood); mineral dissolution/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 for credit

Also offered for graduate-level credit as CE587 and may be taken only once for credit. . Prerequisite: CE 371 or Ch 223 with a "C-" or better.. Cross-Listed as: Ch 487.

## CE 488 - Air Quality (4)

An overview of urban air quality issues 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 graduate-level credit as CE588 and may be taken only once forcredit.. Prerequisite: Junior standing.. Cross-Listed as: ESM 460.

CE 489 - Introduction to Advanced Environmental Fluid Mechanics (4)
Advanced introduction to thegeophysical fluid flows, including properties of seawater; conservation of mass, energy and momentum; dimensional analysis; the Navier-Stokes, 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 graduate-level credit as CE589 and may be taken only once forcredit.. 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-S oil 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 soiland 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 CE 590 and may be taken only once forcredit.. Prerequisite: Seniorstanding.

## CE 493 - Design and Operation of Bicycle and Pedestrian Infras tructure (4)

Design and operational concepts in the engineering design ofbicycle and pedestrian infrastructure. Course covers on-road and shared path locations. Specific topics include design details ofbikeways, 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 ofC- 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 - Sus tainable Trans portation 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. Des ign 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 once forcredit. . Prerequisite: Minimum GPA 3.0, senior status or graduate level from all disciplines and majors..

## CE 497 - Transportation \& Health (4)

Introduction to the linkages between transportation investments, public policy, and behaviors and various related public and individual health outcomes. Content is divided into four modules covering: a) healthy behaviors, b) exposure to unsafe conditions, c) disaster relief/emergency response andd) 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 instructor.

## 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 issues relevant to civil and environmental engineers, including contract law, environmental law, professional liability/negligence, and property law. This course will consider legal decisions, statutes and adminis trative rules, and case studies relevant to the practice of civil and environmental engineering.
Also offered for undergraduate-level credit as CE411 and may be taken only once for credit.. Prerequisite: Graduate-standing..

## CE 512 - Sus tainability 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 forzero net energy, urbanheat management and minimization, "green vs. "gray" in waste water treatment, and feasibility of energy frombiomass.
Also offered for undergraduate-level credit as CE 412.. Prerequisite: CE 362 or CE 341 or CE 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 CE 414.. 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 and examples of actual structural failures.

Also offered for undergraduate-level credit 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 seis mic forces.

Also offered for undergraduate-level credit as CE417 and may be taken only once for credit. . Prerequisite: CE 325.

## CE 518 - PrestressedConcrete Design (4)

Analysis and design of components of prestressed concretestructures with reference to current codes.

Also offered as CE 618 and may be taken only once for credit. . Prerequis ite: CE 435/535..

## 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 Res is tance Factor Design specifications.
Also offered for undergraduate-level credit as CE419 and may be taken only once for credit. . Prerequisite: CE 325..

## CE 523 - Vibration Analysis in Structural Engineering (4)

Fundamentals of vibrationtheory; 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 Analys is (4)

Fundamental concepts of analysis for statically determinate and indeterminate structures utilizing matrices and computers; dis placement and force methods applied to trusses and rigid frames; techniques for the analysis of large complex structures forstatic and dynamic 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: CE 325..

## 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 response of structures to dynamic loadings. Stresses and deflections in structures.

Also offered as CE 629 and may be taken only once for credit. . Prerequisite: CE 423/523..

## 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-level credit 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 resis tance factordes ign 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 Res istance Factor Design (LRFD) methods of the AISI specification.

Also offered for undergraduate-level credit as CE433 and may be taken only once for credit. . Prerequisite: CE 432/532..

## CE 534 - Advanced ReinforcedConcrete Design (3)

Design of spandrel beams, slabs on beams, shear walls, deep beams, corbels, and other components of reinforced concrete structures with reference to current codes.
Also offered as CE 634 and may be taken only once for credit. . Prerequisite: CE 435..

## 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 beamand column behavior.

Also offered for undergraduate-level credit as CE435 and may be taken only once for credit. . Prerequisite: 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; seis mic design criteria and provisions for buildings and other structures; and review of current practices for earthquake res istant 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 ofmetal structures including connections, plate girders, design loads, structural systems, and bracing.

Also offered as CE 639 and may be taken only once for credit.. Prerequisite: CE 432 or CE 532..

## CE 540-Geosynthetics 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 fortransportation, structural, and geotechnical disciplines. Use ofgeotextiles, 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 soilbehavior related to stress-strain, shear strength, permeability, and consolidation.

Also offered as CE 641 and may be taken only once for credit.. Prerequis ite: 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. Developmentof fundamental analytical solution techniques for engineering with soil, the use and limitations of elasticity assumptions. Three lectures, one 3-hour 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 ofgeotechnical earthquake engineering. Topics include earthquake characteristics, attenuation relationships, fundamentals of soil liquefaction, semi-empirical procedures for liquefaction triggering assessment for cohesionless soils, consequences of liquefaction, cyclic softening of cohesive soils, liquefaction mitigation techniques, and current research 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 numerical schemes to foundation design.

Also offered as CE 644 and may be taken only once for credit.. Prerequis ite: 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 eros ion 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 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. Use of 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 Analys is (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 andman-made slopes, available instrumentation to monitors lope stability, and methods to mitigate or increase the factor of safety of marginal slopes.

Also offered for undergraduate-level credit as CE447 and may be taken only once for credit.. Prerequisite: Graduate standing..

## CE 548 - 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 geotechnicalengineers. The case studies will illustrate how to identify important site 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 andAnalysis (4)

Comprehensive study of both driven and augered pile foundations, including concrete, steel, and timber. Indepth review of design methods for axial and lateral capacity. Special emphasis 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: CE 444..

## CE 550-Transportation Safety Analysis (4)

Incorporating safety in highway 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. . Prerequis ite: 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 analysis of the impacts of freight and logistics on the transportation systemand the economy, equity, emissions, 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 multimodal trans portation engineering data sets through applied analysis and visualization techniques. Includes an overview of data types, techniques for graphical analysis of data, and exposure to common software and statistical tools and visualizations in transportation engineering.

Prerequisite: graduate admission in Civil and Environmental Engineering..

## CE 558 - Public Transportation Systems (4)

Performance characteristics of public transportation systems, with emphasis on urban systems. Planning, design, and operational is sues related to public transportation systems. Emerging technologies.
Also offered for undergraduate-level credit as CE458 and may be taken only once for credit. . Prerequis ite: 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; data interpretation; analysis techniques; diagrams; simulation queuing; optimization.

Also offered for undergraduate-level credit as CE459 and may be taken only once for credit. . Prerequis ite: CE 351. CE 454 recommended..

## CE 561 - Water Res ource Systems Analysis (4)

A development of quantitative techniques used in the analys is of water resource systems for planning, design and operation. Emphasis 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 661 and may be taken only once for credit..

## CE 562 - Traffic Engineering Applications and Signal Timing (4)

Theory and practice oftraffic signaltiming. Focuses on terms associated with signal timing, relating practice in the field with analys is 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-level credit 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 emphasis on transportation and logistics problems.
Prerequisite: Graduate standing.

## CE 565 - Watershed Hydrology (4)

Study of the movement and storage of water in waters heds, emphasizing physical processes. Includes systems analysis of watersheds, precipitation, snowmelt, infiltration, evapotranspiration, groundwater flow, streamflow generation, open channel flow, 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-Listedas: This is the same course as ESM 525 and may be taken only once forcredit..

## CE 566 - Environmental Data Analys is (4)

Application of probabilistic andstatistical 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 distributions, simple and multiple and multivariate regres sion and their applications to analysis 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 System Analysis (4)

Principles in analys is of dynamic systems with specific emphasis onhydrologic model building. Variety of techniques in hydrologic systemanalysis with mathematical formulation, development and use of 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 prerequisites: 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, history of groundwater usage, aquifer classification and properties, Darcy's experiments and Law, hydraulic head and potential, porosity and permeability, transmis sivity and storativity, heterogeneity and anisotropy, 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-level credit as CE469 and may be taken only once for credit. .

## CE 571 - Subs urface Contaminant Trans port (4)

Principles as sociated with the transport and fate of contaminants in subsurfacesystems. 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); mathematical formulations of heat and mass advective and diffusive transport; descriptions of molecular diffusion, turbulent diffusion, and dispersion. Use of predictive mathematical models as a bas is for water and air quality management.
Also offered as CE 672 and may be taken only once for credit. . Prerequisite: CE 361 and CE 371..

## CE 573 - Numerical Methods in Environmental and Water Res ources Engineering (4)

Introduction to the mathematicals solution of partial differential equations by finite difference and finite element techniques. Development of solution approaches to water quality and hydraulic problems in surface and groundwater systems. Analysis 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, disinfection, sludge treatment and disposal, advanced waste-water treatment processes.

Also offered for undergraduate-level credit as CE474 and may be taken only once for credit. . Prerequis ite: Ch 223 or CE 371 or CE 487 or graduatestanding..

## 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 heat conservation. Applications include turbulence modeling, finite depth water motions, stratified flow phenomena, and seiche phenomena.
Also offered as CE 676 and may be taken only once for credit. . Prerequisite: CE 361, 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
dissolved oxygen, temperature, nutrients, and algal dynamics.

Also offered as CE 678 and may be taken only once for 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 oforganics; 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 graduatestanding.. 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 trans formations, and bioaccumulation.

Also offered for undergraduate-level credit as CE480 and may be taken only once for credit. . Prerequis ite: 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 bas in ecosystem, and relates these processes to the basin's management context. The geographic scope includes the watershed, the mainstemand 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 present or 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-level credit as CE481 and may be taken only once for credit. . Prerequis ite: juniorstanding..

## 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-level credit 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-drivencirculation, internal tidal asymmetry and frontal propagation. Expected preparation: CE 576.
Also offered for undergraduate-level credit as CE483 and may be taken only once for credit. . Prerequisite: CE 361 and CE 371..

## CE 585 - Environmental Cleanup and Restoration

 (4)Survey of procedures for evaluating risks posed by hazardous wastes ites and thecleanup steps that lead to an acceptable restoration of such sites. Topics include U.S. environmental law and regulation, site investigations, risk ass essment, 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: juniorstanding or graduate standing..

## CE 586 - Environmental Chemistry (4)

Survey of chemical aspects ofmajor environmental is sues: stratospheric ozoneholes and chlorofluorocarbons; air pollution; global climate change; fossil fuel energy/"carbon footprint"; renewable energy; nuclear energy/radioactivity; toxic chemicals (pesticides, PCBs); endocrine dis ruptors; surfactants, chemical dispersants/oil spills; biodegradability of chemicals; chemistry ofnatural 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-level credit 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-to-complexacid/base chemistry; titration curves; buffer strength; acid/base chemistry of carbon
dioxide in open and closed systems; alkalinity as systemvariable (blood); mineral
dissolution/precipitation (metal carbonates); redox chemistry: pe-pH, redoxsuccession/organic loading/dissolved oxygen loss, nitrate reduction, iron oxide dis solution, hydrogen sulfide production, methane formation. This is the same course as Ch 587 and can be taken oly once for credit.
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 issues 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 meas urement and modeling techniques. Expected preparation: CE371.
Also offered for undergraduate-level credit as CE488 and may be taken only once for credit.. Prerequisite: juniorstanding.. Cross-Listed as: ESM 560.

## CE 589 - Introduction to Advanced Environmental Fluid Mechanics (4)

Advanced introduction to thegeophysical fluid flows, including properties of seawater; conservation of mass, energy and momentum; dimensional analysis; the Navier-Stokes, 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: CE 589L.
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. 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 undergraduate-level credit as CE490 and may be taken only once for credit. . Prerequisite: senior/gradstanding..

## CE 593 - Design and Operation of Bicycle and Pedestrian Infras tructure (4)

Design and operational concepts in the engineering des ign ofbicycle and pedestrian infrastructure. Course covers on-road 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 undergraduatecredit as CE493 and may be taken only once forcredit..

## CE 595 - Sus tainable 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-level credit as CE495 and may be taken only once for credit.. Prerequisite: Minimum GPA 3.0, senior status or graduate level from all disciplines and majors..

## CE 596 - Theories \& Methods of Travel Behavior (4)

Covers the various theoretical pers pectives on travel behavior and themethodological approaches used to analyze and understand behavior. Travel behavior includes thestudy 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 ins tructor..

## CE 597 - Transportation \& Health (4)

This course will introduce the linkages between transportation investments, public policy, and behaviors and various related public and individual health outcomes. The content is divided into four modules covering: a) healthy behaviors, b) exposure to uns afe conditions, c) disaster relief/emergency response andd) 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 thedesign, adminis tration, and analysis of various types of surveys used to collect transportation
data, including but not limited to household travel surveys, es tablishment surveys, intercept surveys, 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 - Diss ertation (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 instructor.

## 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 - PrestressedConcrete Design (4)

Analysis and design of components of prestressed concretestructures with reference to current codes.

Also offered as CE 518 and may be taken only once for credit. . Prerequis ite: CE 435/535..

## CE 624 - Matrix and Computer Methods in Structural Analysis (4)

Fundamental concepts of analysis forstatically 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 dynamic 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: CE 325 ..

## 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 responseofstructures to dynamic loadings. Stresses and deflections in structures.

Also offered as CE 529 and may be taken only once for credit. . Prerequis ite: CE 423/523..

## CE 634 - Advanced Reinforced Concrete Design

 (3)Design of spandrel beams, slabs on beams, shear walls, deep beams, corbels, and other components of reinforced concrete structures 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 ofstructures to ground motions; determination and use of response spectra; seismic design criteria and provis ions for buildings and other structures; and review of current practices for earthquake res istant design.

Also offered as CE 537 and may be taken only once for credit.. Prerequisite: 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 consolidation.

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 analysis 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-s tructure problems, stability of soil masses and foundation installation. Use of commercial computer programs in working applied problems.
Also offered as CE 546 and may be taken only once for credit.. Prerequis ite: CE 444 ..

## CE 649 - Deep Foundation Design and Analysis (4)

Comprehensive study of both driven and augered pile foundations, including concrete, steel, and timber. Indepth review of design methods for axial and lateral capacity. Special emphasis on the differences between driven piles and drilled shafts, including the role offull-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: CE 444..

## CE 661 - Water Res ource Systems Analysis (4)

A development of quantitative techniques used in the analys is of water resource systems for planning, design and operation. Emphasis is placed on the physical, legal and economic aspects and their incorporation into simulation models. Applications include reservo ir 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 ofenvironmental data with a focus on hydrology and water quality. Graphical and quantitative techniques of exploratory data analysis, selection and fitting of appropriate probability distributions, simple and multiple and multivariate regression and their applications to analysis 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: graduate standing and Stat 243 and 244 or Stat 460 ..

## CE 668 - Advanced Methods in Hydrologic System Analysis (4)

Principles in analysis of dynamic systems with specific emphasis onhydrologic model building. Variety of techniques in hydrologic systemanalysis with mathematical formulation, development and use of computer-based models for solving scientific and engineering problems are dis cussed. 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 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 Trans port (4)

Principles as sociated with the transport and fate of contaminants in subsurfacesystems. 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 once for 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 ofmoleculardiffusion, turbulent diffusion, and dispersion. Use of predictive mathematical models as a basis for water and air quality 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 differential equations by finite difference and finite element techniques. Development of solution approaches to water quality and hydraulic problems in surface and ground water systems. Analysis of model sensitivities, calibration and verification.

Also offered as CE 573 and may be taken only once for credit. . Prerequis ite: senior or graduate standing in civil or environmental engineering..

## CE 676 - Environmental Fluid Mechanics (4)

Introduction to the fundamentals of the fluid dynamics of naturalsurface 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: CE 361, 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 perspectives 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 decis ions.
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, establishmentsurveys, intercept surveys, and freight/commercial vehicle surveys.

Also offered as CE 598, and can only be taken once for credit.. Prerequis ite: 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 His tories 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 de-valuation of this work and institutions as gendered settings. Students will also critically consider the racialized history of this work and resistance by communities served by these professions.

CFS 360-Critical Dis ability: Impacts on Children, Youth, \& Families (4)

Focuses on thesocial, his torical, 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 discourses. Emphasizes intersections of dis ability with other identities and positionalities (gender, sexuality, race, class, etc.). Impacts of disability discourses and structures on children, youth, and families will be examined.
Prerequisite: Upper-division standing.

## 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 HRSE lessons.

## CFS 312U- Families in Lifecourse Perspective (4)

This course offers a deeper understanding of family life and its intersection with individual development across 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 from birth to death. Students will have the opportunity to critically process developmental theories through lecture, dis cussion, videos, and assignments. There will be a focus on is sues of diversity, anti-oppression, and socialjustice.

Prerequisite: junior standing..
CFS 320U- ABCs of Early Childhood Education (4)

An introductory class for students preparing for parenthood or interested in careers in early childhood education. History and philosophy; observation processes; guidance approaches; and program as sessment.

## CFS 330 U- American Families in Film and Television (4)

Examines portrayals of American families in film and televis ion over time, including theeffect 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 is sues of inclusion/exclusion in family portrayals.

## CFS 340U- Queer Families (4)

Explores and investigates is sues facing les bian, gay, bis exual, and transgender (LGBT) families, including all relationships in which primary care-giving responsibilities are shared by individuals who are interdependent upon each other, including conjugal and non-conjugal relationships. We will consider LGBT families and their cultural, political, gender, racial, and economic dimensions.

## CFS 350U - Interpers onal 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 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: juniorstanding.

## CFS 382U- Mental Dis orders: Is sues for Families and Communities (4)

Explores the etiology of mental and emotional disorders and the impact on individuals, their families and communities. The courseemphasizes 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: juniorstanding..

## CFS 385U - Working with Diverse Families (4)

For individuals who are preparing to work professionally with families. Theoretical perspectives on working with families. Issues involved when working with diverse U.S. families (African American, Asian, Russian, and Hispanic) as well as international families.

## 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.

Prerequis ite: junior standing..

## CFS 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 Res ources and Family Support (4)

Examination of community resources 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 behalfof 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 (112)

(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 organizations and agencies that servechildren and families. One credit equals 30 hours. Includes reflective, integrative seminar.
Prerequisite: CFS 494. .

## CFS 410 -Selected Topics (1-8)

(Credit to be arranged.)

## CFS 410U-Selected Topics (4)

(Credit to be arranged.)

## CFS 450 - Youth and Youth Work (4)

Emphasizes multiple lenses through which young people are seen and treated. Explores youth work principles, multiple youth work traditions, experientia//outdooreducation, youth development,
and other dimensions of youth work. Includes community-based component for application of theory. Intended for students planning careers in education, policy, and direct service with youth. Required course for Child \& Family Studies Youth Worker specialization. Graduate students will participate in one hour of additional class time per week, to be scheduled with the ins tructor at the first class session.
Also offered for graduate-level credit as CFS 550 and may be taken only once for credit.. 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 prerequis ite: 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 professions 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 professional practice might be affected. Projects will include a professional 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 transform oppressive social structures, values, and behaviors.
Prerequisite: CFS 487 and juniorstanding..

## CFS 489-Activis mfor Social Change (2)

This course prepares students for activismin professional settings serving children, youth, and families. Building on CFS 487 and CFS 488, students will study social change and activism. They will research a social injustice, conceptualize and carry out a social change action, and reflect on lessons learned for theiractivism.

Prerequisite: CFS 488.

## CFS 492 - Family Law and Policy (4)

Laws and policies that influence thewell-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 assist students 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 personal development, professional identity, and professional action contribute to our developing professional self. This course will examine "ways of knowing" and the construction of knowledge in our interdis ciplinary professional fields. Students will critically reflect on the "ways of knowing" and develop their research literacy. Emphasis will be placed on reflection, personal ethics, self-care, interdisciplinary career paths, and scholarly foundations.

Prerequisite: Admittance to Child \& Family Studies..

## CFS 494-Profess ional Self: Critical Thinking (2)

Students will beg in the process of documenting their achievementof the first CFS Learning Outcome as they es tablish the foundation of the CFS Professional Portfolio. The history and development of femaleintensive 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 perspectives and the ways in which personal 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 documenttheir achievement of the final CFS 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 - Practicum I (5)

Child and Family Studies practicumconducted in approved professional settings with consideration for students' professional goals.
Prerequisite: junior standing, admittance to Child and Family Studies Program, grade of IP in CFS $494 .$.

## CFS 498 -Practicum II (5)

Child and Family Studies practicumconducted in approved professional settings selected with cons ideration of students? professional goals. Accompanying seminar.

Prerequisite: admittance into the CFS program, five credits ofCFS 497 (PracticumI) senior status, 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 550 - Youth and Youth Work (4)

Emphasizes multiple lenses through which young people are seen and treated. Explores youth work principles, multiple youth work traditions, experiential/outdoor education, youth development, and other dimensions of youth work. Includes community-based component for application of theory. Intended for students planning careers in education, policy, and direct service with youth. Required course for Child \& Family Studies Youth Worker specialization. Graduate students will participate in one hour of additional class time per week, to be scheduled with the instructor at the first class session.

Also offered for undergraduate-level credit as CFS 450 and may be taken only once for credit.. Prerequisite: juniorstanding..

## CFS 580 -Societal Influences on Profes sional Practice (4)

Individuals preparing for human or social services professions have been influenced by family and societal events, values, beliefs, and as sumptions 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 professional 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: juniorstatus.
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 notsatisfy the first-year Chemistry requirement for most science and engineering majors.
Prerequis ite: Two years of high school algebra or 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 notintended for science 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 notintended for science 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 formost 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. Pass/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/no pass 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 respectively. Concurrent enrollment in the appropriate lecture course is required. Ch 107, 108; one 2-hour laboratory period. Pass/no pass 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 science presupposed by the General Chemistry sequence (Ch 221, Ch 222, and Ch 223). Designed for students needing a review of topics fromhigh school chemistry and Mth 111. Successful completion of this courseshould 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 ChemistryI (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 first course in a sequence ofthree: Ch 221, Ch 222, and Ch 223. Ch 104 - Ch 109 does not satisfy the first-year Chemistry requirement for most science and engineering majors.
Prerequisite:Math Department-approved placement into Mth 111 or Mth 112. High school chemistry or equivalent is recommended..

## Ch $\mathbf{2 2 1 H}$ - Honors General Chemistry I (4)

Honors GeneralChemistry will address the topics of general chemistry with a focus on the urban context and the principles of green chemistry. The course is designed to challenge well-prepared students and will utilize alternative modes of instruction in smaller 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 chemistry.
Corequisite: Ch 227H.

## Ch 222 -General Chemistry II (4)

Fundamental basis of chemistry 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 not satisfy the first-year Chemistry requirement for most science and engineering majors.
Prerequisite:Ch 221..

## Ch 222H- Honors General Chemistry II (4)

Honors General Chemistry will address the topics of general chemistry with a focus on the urban context and the principles of green chemistry. The course is des igned to challenge well-prepared students and will utilize alternative modes of instruction in smaller 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 UniversityHonors Program. Students should have taken at least one year ofhigh-school chemis try.
Corequisite: Ch 228H..

## Ch 223 -General Chemistry III (4)

Fundamental basis of chemistry 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 third course in a sequence of three: Ch 221 , Ch 222 , and Ch 223 . Ch 104 - Ch 109 does not satisfy the first-year Chemistry requirement for most science and engineering majors.
Prerequisite:Ch 222 ..

## Ch 223H- Honors General Chemistry III (4)

Honors General Chemistry will address the topics of general chemis try with a focus on the urban context and the principles of green chemistry. The course is des igned to challenge well-prepared students and will utilize alternative modes of instruction in smaller 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 ofhigh-schoolchemistry. Corequisite: Ch 229H..

## Ch 227 -General Chemistry Laboratory (1)

Laboratory work to accompany General Chemistry (Ch 221, Ch 222, Ch 223). Concurrent enrollment in the appropriatelecture 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 227H- Honors Lab for Ch $\mathbf{2 2 1 H}$ (1)

Laboratory work to accompany Honors General Chemistry (Ch 221H, Ch 222H, Ch 223H). Completion of or concurrent enrollment in lecture required. One 3 -hour laboratory.
Corequisite: Ch 221H..

## Ch 228 -General Chemistry Laboratory (1)

Laboratory work to accompany General Chemistry (Ch 221, Ch 222, Ch 223). Concurrent enrollment in the appropriatelecture 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 222H(1)

Laboratory work to accompany Honors General Chemistry (Ch 221H, Ch 222H, Ch 223H). 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 223H(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 fromthe standpo int 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 ofstudents in Ch 221 , Ch 222 , Ch 223 general chemistry sequence. Corequisite: corresponding lecture course Ch 221 , Ch 222 , Ch 223. Pass/no pass 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 ofstudents in Ch 221 , Ch 222 , Ch 223 general chemis try sequence. Corequisite: corresponding lecture course Ch 221, Ch 222, Ch 223. Pass/no pass 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. Corequisite: corresponding lecture course Ch 221, Ch 222, Ch 223. Pass/no pass 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 analytical chemistry.

Prerequisite: Ch 223 and Ch 229..

## Ch 321 -Quantitative Analysis Laboratory (2)

Basic quantitative analytical laboratory work including volumetric and instrumentalmethods.

Prerequis ite: 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. Concurrent enrollment 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. Concurrent enrollment 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 sequenceof 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 Ch 327, Ch 328. This is the second course in a sequence of two: Ch 331 and Ch 332. Recommended prerequis ite: Ch 331 ; concurrent enrollment in Ch 328 is recommended.
Corequisite: Ch 328..

## Ch 334-Organic Chemistry I(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 for chemistry and biochemistry majors, and Ch 337, Ch 338 for non-chemistry majors. This is the first course in a sequence of 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 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 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 chemistry of the compounds of carbon. Meets chemistry and biochemistry major requirements. The corresponding laboratory courses are Ch 337, 339 for chemistry and biochemistry majors, and Ch 337, 338 for nonchemistry majors. This is the third course in a sequence of three: Ch 334, Ch 335, and Ch 336. Concurrent enrollment 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 ofCh 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 or concurrent enrollment in Ch 335 ..

Ch 338R-Recitation for CH 337/CH338 (0)
Recitation for Ch 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 for chemistry 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 or Ch 336)..

## Ch 360U- Origins of Life on Earth (4)

Scientific description of the chemical events 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 college-level 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 organic chemistry sequence. Corequisite: corresponding lecture course Ch $334,335,336$. Pass/no pass only. This is the first course in a sequence of three: Ch 384, Ch 385, and Ch 386.
Corequisite: Ch 334.

## Ch 385 - Organic Chemistry Workshop II (1)

Optional peer-led problem-solving sessions designed to promote the success of students in Ch 334, 335, 336 organic chemistry sequence. Corequisite: corres ponding 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 Workshop III (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 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)

Consentof instructor and chair ofdepartment. 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)

Consentof 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: consentof instructor and chair ofdepartment. (Credit to be arranged.)

## Ch 407 -Seminar (1-6)

Consentof instructor. Ch 507 pass/no pass only. (Credit to be arranged.)

## Ch 408 - WorkshopLeader (1-3)

Optional peer-led problem-solving sessions designed to promote the success ofstudents in Chemistry. Corequisite: corresponding lecture course.

## Ch 410 -SelectedTopics (1-6)

Consent of instructor 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 once for credit. . Prerequisite: Ch 223..

## Ch 412 - Advanced Inorganic Chemistry II (4)

Ligand field theory, coordination chemistry, transition metals, org anometallic chemistry, acids and bases, nonaqueous solvents, and descriptive chemistry of the elements.

Also offered for graduate-level credit as Ch 512 and may be taken only once for credit. . Prerequisite: Ch 411. Recommended prerequis ites: Ch 442 ..

## Ch 412a- MODULE: Coordination Chemistry (2)

An exploration ofbonding in metal complexes and the effect that bonding has on the properties of the complex. Including topics are: crystal field theory, molecular orbital theory, ligand field theory, pibonding, the chelate effect, electron counting.
Also offered for graduate credit as Ch 512a and may only be taken once for credit.. 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 emphas is is on the application of modern physical chemis try to problems of biological interest. 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 417 -Physical Chemistry for the Biosciences II (4)

Intended primarily forstudents in the biological sciences and allied medicalhealth fields. The emphasis is on the application of modern physical chemistry to problems of biological interest. Ch 416 includes thestudy of heat, work, energy, entropy, vapor pressure, chemical equilibrium, and transport phenomena. Ch 417 covers chemical and enzyme kinetics, quantumchemistry, photochemistry, and spectroscopy. Courses mustbe taken in sequence. Recommended prerequisite: Ch 320, 321, a year of generalphysics 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 forcredit. .

## Ch 424 - Electronics and Instrumentation for Chemists (2)

Selected topics in chemical instrumentation will be presented at a basic level. Representative topics are current and voltage measurements, voltage dividers, simple filters, introduction to operational amplifiers and digital circuits. Requires concurrent enrollment 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 3hour lab periods. Requires concurrent enrollment in Ch 424/524.

Also offered for graduate-level credit as Ch 525 and may be taken only once for credit..

## Ch 426 - 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 graduate-level credit as Ch 526 and may be taken only once for credit..

## Ch 427 - Instrumental Analys is Laboratory (4)

Laboratory work to accompany Ch 426 , including electrochemistry, chromatography, and atomic and molecular spectroscopy instruments. Writing intensive course. One 5-hour laboratory period, two 2-hourrecitations.

Also offered for graduate-level credit as Ch 527 and may be taken only once forcredit..

## Ch 430 - Advanced Organic Chemistry (4)

Advanced treatment ofgeneralorganic reactions and structure; emphasis on bonding, stereochemistry, the correlation of structure and reactivity, scope and mechanisms 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 generalorganic reactions and structure; emphasis on bonding, stereochemistry, the correlation of structure and reactivity, scope and mechanisms of organic 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 molecular structure. 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 or concurrent enrollment.

Also offered for graduate-level credit as Ch 537 and may be taken only once forcredit. .

## Ch 440 - Physical Chemistry I(4)

The study of thermodynamics, phase and chemical equilibria, solutions, electrochemis try, reaction rates and mechanisms, quantummechanics, spectroscopy, electron transport, molecular modeling and statistical mechanics. This is the first course in a sequence of three: Ch 440, Ch 441, and Ch 442. Expected preparation: Ch 320, 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, quantummechanics, spectroscopy, electron transport, molecular modeling and statistical mechanics. This is the second course in a sequence of three: Ch 440, Ch 441, and Ch 442. Expected preparation: Ch 320, 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: Ch 440, 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 analysis 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 forcredit. . 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 forcredit. .

## 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 forcredit. .

## Ch 446 -Module: Biophysical methods I (2)

This 5-week intensive coursecovers 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 aspects 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. Prerequisite: (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 emphasis is placedon synthesis and physical characterization. Expected preparation: Ch 338 or Ch 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 concurrent enrollment in $\mathrm{Ch} 492 / 592$.

Also offered for graduate-level credit as Ch 560 and may be taken only once for credit. .

## Ch 470-NMR Spectroscopy (4)

Nuclear magnetic res onance spectroscopy theory and practice. Bas ic quantumtheory ofmagnetic moments, the semi-clas sical vector modelof spins, and the product operator formalism will be applied using a variety of NMR spectroscopic techniques. Expected preparation: Ch 417 or Ch 442.

Also offered for graduate-levelcredit as Ch 570 and may be taken only once for credit. .

## Ch 470c-MODULE: Practical NMR Spectroscopy (2)

This course will focus on the practical as pects of obtaining NMR spectroscopic data from
instrumentation such as one would encounter in a res earch or industrial setting.

Also offered for graduate-level credit as Ch 570c and may be taken only once for credit.. Prerequisite: Ch 417 or Ch 442.

## Ch 471 - 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 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 biologicalsystems, which is important becausethis is different to small-molecule NMR. There is also a large and expanding literature in biological NMR, 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; globalclimate change; fossil fuelenergy/"carbon foot print"; renewable energy; nuclear energy/radioactivity; toxic chemicals (pesticides, PCBs); endocrine disruptors; surfactants, chemical dis persants/oils pills; 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: CE 486.

## Ch 487 - Aquatic Chemistry (4)

Aqueous chemistry in natural water systems: simple-to-complexacid/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 CE 487 and can be taken only once for credit.

Prerequisite: Ch 223.. Cross-Listed as: CE487.
Ch 490 -Biochemistry: Structure andFunction (4)
First term of a three-term course for students preparing for professional biochemical work. Structures of ${ }^{\text {biological molecules and assemblies, }}$ 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 orCh $440 / 540$, Ch 320/321, and Bi 253.

Also offered for graduate-level credit as Ch 590 and may be taken only once forcredit. .

## Ch 491 -Biochemistry: Enzymology and Metabolism (4)

Second termofa three-term course for students preparing for professional biochemical work. Basic principles of enzyme catalysis and mechanism, the chemistry and energetics of the primary metabolic pathways responsible for life, including glycolysis/gly coneogenesis, 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 and Biological Information Flow (4)

Third term of a three-term course 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
assembly, manipulation of metabolic pathways, and alteration of the genetic code. Required preparation: Organic Chemis try AND either Biochemistry or Molecular Biology. Co-requisite: Ch 492 or Bi 334 (for students who completed Ch 491 but neither Ch 350 norBi 334).

Prerequisite: Ch 335. Grade ofB- orbetter 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 of DNA sequence dependentstability, RNA secondary structure prediction and RNA folding; chemistry and thermodynamics of structure/functional mechanisms of ribozymes, large DNA-protein and RNA-protein complexes
Also offered for graduate-level credit as Ch 597 and may be taken only once for credit.. Prerequisite: Ch 492.

## Ch 498 -MODULE: Protein Dynamics and Folding (2)

This 5-week intens ive course will develop an advanced understanding of the molecular forces that govern protein structure, folding and dynamics. We will discuss the theoretical aspects 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.. Prerequis ite: (Ch 490 or Ch 350 ) and ( Ph 203 or Ph 213 ) and Mth 251 and Mth 252.

## Ch 501 - Research (1-9)

Consentof 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 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)

Consent of instructor and department chair. Ch 505 pass/no pass only. (Credit to be arranged.)

## Ch 507 -Seminar (1-6)

Consent of instructor. Ch 507 pass/no pass only. (Credit to be arranged.)

## Ch 510 -Selected Topics (1-6)

Consent of 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, org anometallic chemistry, acids and bases, nonaqueous solvents, and descriptive chemistry of the elements.

Also offered for undergraduate-level credit as Ch 412 and may be taken only once for credit. . Prerequisite: Ch 411. Recommended prerequisites: Ch 442.

Ch 512a- MODULE: Coordination Chemistry (2)
An exploration ofbonding in metal complexes and the effect that bonding has on the properties of the complex. Including topics are: crystal field theory, molecular orbital theory, ligand field theory, pibonding, the chelate effect, electron counting.

Also offered for undergraduatecredit 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 412 b and may only be taken once forcredit.. Prerequisite: Ch 512a..

## Ch 515-SelectedTopics in Inorganic Chemistry (3)

Current topics in inorganic chemistry such as advances in oxidation, solution chemistry, and fluorine chemis try. 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 forstudents in the biological sciences and allied medical health fields. The emphasis is on the application of modern physical chemistry to problems of biological interest. Ch 416 includes the study of heat, work, energy, entropy, vapor pressure, chemicalequilibrium, 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 generalphysics with calculus, and two terms of calculus. Recommended prerequis ites: Ch 223 and Ch 229.

## Ch 517-Physical Chemistry for the Biosciences II (4)

Intended primarily forstudents in the biological sciences and allied medical health fields. The emphasis is on the application of modern physical chemistry to problems of biological interest. 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 yearof general physics with calculus, and two terms of calculus. Recommended prerequis ites: Ch 223 and Ch 229.

## Ch 518 -Advanced Chemistry Laboratory (4)

Advanced techniques and theiruse 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 ins trumentation will be presented at a basic 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 undergraduate-level credit 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 3hour lab periods. Requires concurrent enrollment in 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 spectroscopy instruments. 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 ofgeneral org anic 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 530 and Ch 531. Expected preparation: Ch $336,442 / 542$, or $417 / 517$.
Also offered for undergraduatecredit as Ch 430 and may be taken only once for credit. .

## Ch 531 -Advanced Organic Chemistry (4)

Advanced treatmentof general org anic reactions and structure; emphasis on bonding, stereochemis try, the correlation of structure and reactivity, scope and
mechanisms of organic reactions classified 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 undergraduatecredit as Ch 431 and may be taken only once forcredit. .

## 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-level credit as Ch 435 and may be taken only once for credit. . Prerequis ite: Ch 336.

## Ch 536 - Spectrometric Analys is (3)

Ultraviolet, infrared, nuclear magnetic resonance and mass spectrometry in the analysis of molecular structure. Expected preparation: Ch 336 and Ch 339.
Also offered for undergraduate-level credit as Ch 436 and may be taken only once for credit. .

## Ch 537 -Spectrometric Analysis Laboratory (1)

Use of infrared spectrometers and nuclear magnetic resonance spectrometers. One 3-hour laboratory period. Expected preparation: Ch 436/536 or concurrent enrollment.

Also offered for undergraduate-level credit as Ch 437 and may be taken only once for credit. . Prerequis ite: Ch 536 (concurrent enrollment allowed).

## Ch 540 - Physical Chemistry (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 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 ofthermodynamics, phase and chemical equilibria, solutions, electrochemistry, reaction rates and mechanisms, quantummechanics, spectroscopy, electron transport, 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 transport, molecularmodeling and statistical mechanics. This is the third 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 442 and may be taken only once for credit. .

## Ch 543 - Numerical Data Analysis and Modeling in Chemistry (2)

The study ofstatistical analysis of experimental data and modeling of fchemical 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 or Ph 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 oftwo: 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 for credit. .

## Ch 546 - MODULE: Biophysical Methods I (Macromolecular Structure) (2)

This 5-week intensive coursecovers the principle methodolog ies 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 aspects 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 orPH213).

## 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 emphasis 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 concurrent enrollment in Ch 492/592.

Also offered for undergraduate-level credit as Ch 460 and may be taken only once for credit. .

## Ch 570 -NMR Spectros copy (4)

Nuclear magnetic resonance spectroscopy theory and practice. Basic quantumtheory of magnetic moments, the semi-clas sical vector model of spins, and the product operator formalism will be applied using a variety of NMR spectroscopic techniques. Expected preparation: Ch 417 or Ch 442.

Also offered for undergraduate-level credit 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 aspects of obtaining NMR spectroscopic data from instrumentation 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 orCh 442.
Ch 571 - Biological NMR Spectros copy (4)
Nuclear magnetic resonance spectroscopy (NMR) of biological systems. The basic theory ofNMR, its application to complexbiologicalmolecules and complexes. Expected preparation: Ch 470/570.

Also offered for undergraduate-level credit as Ch 471 and may be taken only once for credit. .

## Ch 571a-MODULE: Biological NMR Spectroscopy (2)

Nuclear magnetic resonance spectroscopy (NMR) of biological systems. The basic theory of NMR, its application to complexbiologicalmolecules 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 aspects ofmajor 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 CE 586 and can be taken only once for credit.

Prerequisite: Ch 334 orCh 331.. Cross-Listed as: CE 586.

## Ch 587 - Aquatic Chemistry (4)

Aqueous chemistry in natural water systems: simple-to-complexacid/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 CE 587 and can be taken only once for credit.
Prerequisite: Ch 223.. Cross-Listed as: CE587.

## Ch 590 - Biochemistry: Structure andFunction (4)

First term of a three-term course for students preparing for professional biochemical work. Structures of biological molecules and assemblies, including proteins, nucleic acids, and lipids, and how these structures giverise to their biological functions. Expected preparation: Ch 336. Recommended pre-or corequisites: Ch 416 orCh $440 / 540$, 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 termof a three-termcourse fors students preparing for professional biochemical work. Bas ic principles of enzyme catalysis 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. 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 and Biological Information Flow (4)

Third term of a three-term course 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-level credit as Ch 493 and may be taken only once for credit. .

## Ch 596 -Synthetic Biology (4)

Advanced seminar-style clas s surveying the applied interdis ciplinary field of synthetic biology. Topics on engineering and design of new microbialcells include: minimal gene sets, large scale genome assembly, manipulation of metabolic pathways, and alteration of the genetic code. Required preparation: Organic Chemistry AND either Biochemistry or Molecular Biology. Co-requisite: Ch 492 or Bi 334 (for students who completed Ch 491 but neither Ch 350 norBi 334).
Prerequisite: Ch 335. Grade ofB- 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 dependentstability, RNA secondary structure prediction and RNA folding; chemistry and thermodynamics of structure/functional mechanisms ofribozymes, large DNA-protein and RNA-protein complexes.
Also offered for undergraduate-level credit as Ch 497 and may be taken only once for credit.. Prerequisite: Ch 592.

## Ch 598-MODULE: Protein Dynamics and Folding (2)

This 5 -week intens ive course will develop an advanced understanding of the molecular forces that
govern protein structure, folding and dynamics. We will discuss the theoretical aspects 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:
(CH 490 orCH 350) and (PH203 or PH 213) and Mth 251 and Mth 252.

## Ch 601 -Research (1-9)

See department for course description. Pass/nopass 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/nopass 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/nopass 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 inorganic chemis try such as advances in oxidation, solution chemistry, and
fluorine chemistry. As subject matter varies, course may be repeated with consent of ins tructor.

Prerequisite: Ch 511.. Cross-Listedas: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 prerequis ite: Ch 431/531.

Ch 634 - Advanced Topics in Organic Chemistry (3)

Current topics such as stereochemistry, natural products, pericyclic reactions, carboniumions, heterocyclic and polycyclic compounds, organic photochemis try. 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-organic chemistry and their use in the study of mechanisms of organic reactions and reactivities of organic compounds. Recommended prerequisite: $\mathrm{Ch} 431 / 531$.

## Ch 661 - Photochemistry (3)

An introduction to the chemis try of the interaction of light with matter. Absorption and emission 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 absolute rate 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 chemis try of the earth's atmosphere, including global chemical budgets, atmospheric thermodynamics, photo-chemical reactions 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 mechanismofenzymatic reactions.

Prerequisite: Ch 492/592..

## Ch 694 - Nucleic AcidS tructure and Function (4)

Comprehensive examination of nucleic acid structure-function relationships at the molecular level. Geometry ofDNA and RNA will be presented, along with the impact this has on gene expression. DNA structural thermodynamics and RNA-directed catalys is will also be covered.

Prerequis ite: completion of a fullyear of undergraduate-level 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/Latino Studies (4)

An introductory history of Latinos in the United States. Beginning with Spanish colonization and moving to the recentmigration 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, Waron Poverty, the Chicano Movement, andU.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, interand intra-ethnic and racial relations in the community.

## ChLa 302U-Survey of Chicano/Latino Literature (4)

A representativeoverview ofChicano/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 historical events, community organizing, and social is sues will be explored through literature, art, music, and social science research.

## 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-Listedas: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 326U and may be taken only once for credit.

Cross-Listedas:Hst 326U.

## ChLa 330U- Latino Popular Culture (4)

Explores a wide scope of Latino popular culture: highly produced entertainment (television, radio, film, magazines); commercial and noncommercial musicaland artistic expression; popular celebrations; and the cultureof" everyday life," fromtraditional folklore to newly invented customs and rituals. Popularculture is examined to reveal how Latino groups (Mexicans, Cubans, Dominicans, Puerto Ricans, etc.), reinventtheir culture, heritage, and ethnic identity in the United States, and how Latinos in the process are changing American popular culture and national identity. Students will become familiar with theories of popular culture and gethands-on experience investigating a Latino popular culture form.

## ChLa 331 U- Barrio Culture: Art and Literature (4)

A focus on barrio communities as a construction model to Chicano/Latino Studies yields barrio cultures as dynamic sites of historical, visual and cultural production. Examination oftraditions, lifestyles, and values ofChicana/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 (1890s1930s), 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 Mayancivilization and the cultural and artistic contributions of other Mesoamerican societies, such as the Aztecs, during the Classic and Post-Classic 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 class and race relations. EarlyMexican identity will be explored during this period, including its relations to Chicano identity.

## ChLa 345 - Public Art: MexicanAmerican/Chicano Muralism (4)

Introduces the his torical 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 styles and trends. Considers practical information, skills, and techniques. Applies this base knowledge to formulate and evaluate a personal approach to mural art in the developmentof a mural proposal. Create along with the instructora local mural project and/or public art project.

## ChLa 360-Bilingualism in U.S.Latinx Communities (4)

Due to the constant contact between Englishand Spanish in the U.S., a natural bilingual context flourishes in which new linguistic innovations emerge. Even though thesetwo languages coexist, the political, economic, and social capital that English represents accords it a dominant status over Spanish. Froman interdisciplinary perspective, th is course critically analyzes Spanish-English bilingualismthrough sociohis torical, sociopolitical, and sociocultural lenses with thegoal of dismantling monolingual ideologies and emp owering speakers of multilingualdis courses.

## ChLa 375U- Southwestern Borderlands (4)

Social, economic, politicalorganization, 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 contactzone, as well as the continuities and discontinuities 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 presentexperiences 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)

Consent of 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 -Selected Topics (1-8)

See department for course description. (Credit to be arranged.)

## ChLa 410U-SelectedTopics (4)

(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 GuadalupeHidalgo and its affect on Latinos. Additional topics will include issues dealing with why the Puerto Rican and Cuban experience has 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 prerequisite: ChLa 302U.

## ChLa 450U- Latinos in Education (4)

Surveys his torical and contemporary social science research on the factors influencing theeducational status of Latinos in the United States. A briefhistory of the Latino schooling experience serves as an introduction to current issues such as bilingual education, school segregation, and higher education access. Specialattention is given to educational inequalities among Latinos and to the relationship between schooling and limited class mobility.
Prerequisite: upper-division standing..
ChLa 507-Seminar (1-8)
(Credit to be arranged.)

## ChLa 510 -Selected Topics (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 throughoutthe 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 sequenceof 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 vocabulary in characters with correct pronunciation. This is the first course in a sequence of 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 bas ic grammatical structures, developing conversation skills, and building vocabulary in characters with correct pronunciation. This is the second course in a sequenceof 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 bas ic 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 expositorytexts. 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 nonnative speakers only.

## Chn 303 - Third-Year Chinese Term3 (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 emphasis on business vocabulary and procedures. Recommended as a complement to third-year Chinese. Expected preparation: Chn 203; Chn 303, Chn 304. Fornonnative 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 introduceworks 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 orclassicalChinese. 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)

Interdis ciplinary readings fromthe core of the written tradition, including his tory, poetry, classical anecdotes and essays, related to the central is sues facing the Chinese elite throughout history: 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 emphasizes influential works of the twentieth century, fromsemi-traditional to avant-g arde. 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 emphasizes traditional poetry and fiction from 700 BC to the late nineteenth century; 343 emphasizes influential works of the twentieth century, fromsemi-traditional to avant-garde. This is the second course in a sequenceof 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)

Developmentof 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 oftwo: Chn 411 and Chn 412. Expected preparation: Chn 303; Chn 304, Chn 311, Chn 312. Fornon-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 oftwo: Chn 411 and Chn 412. Expected preparation: Chn 303; Chn 304, Chn 311, Chn 312. Fornon-native speakers only.

Also offered for graduate-level credit as Chn 512 and may be taken only once forcredit. .

## Chn 413 -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 classicalChinese literary history. Expected preparation: extensive third-year coursework in Chinese, preferably including Chn 311 and Chn 312. Fornon-native speakers only.
Also offered for graduate-level credit as Chn 513 and may be taken only once forcredit. .

## Chn 420 -Readings in Chinese Literature (4)

Reading, analysis, and discussion of representative literary texts. Chn 420 focuses onpre-modern topics
such as "TraditionalChinese Fiction" and "Chinese Classical Masterpieces," while Chn 421 addresses primarily twentieth-century topics such as "Chinese Nativist Literature" or "ChineseUrban Literature." This is the first coursein a sequence oftwo: Chn 420 and Chn 421. Expected preparation: Chn 303; Chn 304, Chn 311, Chn 312. Fornon-native speakers only.
Also offered for graduate-level credit as Chn 520 and may be taken only once forcredit. .

## Chn 421 - Readings in Chinese Literature (4)

Reading, analysis, and discussion ofrepresentative literary texts. Chn 420 focuses on pre-modern topics such as "TraditionalChinese 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 second 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 521 and may be taken only once forcredit. .

## 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 syntaxin 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 forcredit. .

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 oftwo: 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 classicalChinese literary history. Expected preparation: extensive third-year coursework in Chinese, preferably including Chn 311 and Chn 312.
Also offered for undergraduate-level credit 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 onpre-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 sequence of two: Chn 520 and Chn 521. Expected preparation: Chn 303; Chn 304, Chn 311, Chn 312.
Also offered for undergraduate-level credit 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 onpre-modern topics such as "Traditional Chinese Fiction" and "Chinese ClassicalMasterpieces," while Chn 421 addresses primarily twentieth-century topics such as "Chinese Nativist Literature" or "ChineseUrban Literature." This is the secondcourse in a sequence of two: Chn 520 and Chn 521. Expected preparation: Chn 303; Chn 304, Chn 311, Chn 312.

Also offered for undergraduate-level credit 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 emphas is on the development of the current standard language. Evolution of phonology, morphology, and syntaxin 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 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 - Ins truction and Management in Preschool Education (3)

Growth and developmentcharacteristics of preschool children (ages 3-5) forplanning educational programs, curriculum, instruction, scheduling, and environment, management, and parent communication. Field experience required. Recommended prerequisite: CI251 or coursework in human growth and development.

## CI 253-Preschool Programming (3)

This course will provide experience and 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 forplanning, implementing, and evaluating developmentally appropriate integrated teaching and learning experiences in art, music, movement, drama, and physical education for young learners, ages 4-8 years.

Recommended prerequis ites: admission to teacher education; CI 251.

## CI 351 -Science, Social Studies andHealth for Young Children (5)

This course will provide preparation forplanning, 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; CI251.

## CI 401 - Res earch (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-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 courseware; 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 graduate-levelcredit as CI 532 and may be taken only once for credit..

## CI 433 - Computer Applications in Instruction (3)

A comprehensive survey of the use of microcomputers in instruction. Terminology, educational applications, ethical issues, courseware, evaluation and selection, multimedia applications, management tools for educators, planning and organizing for school computer use, hardware selection, computer literacy and technological literacy, and network res ources for teachers. Handson use of the computer to review courseware is an important part of the course. Expected preparation: CI 432 or equivalent.

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 usefultools for clas sroom, personal, and professional use: word processing, database, spreadsheet, survey, and statistical applications. Each class session includes demonstration and hands-on useof microcomputers. Each student will develop a wordprocessed 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 EnglishLanguage Learners (ELL) at all grade levels in the learning process. Special attention will be given to students' bilingual/bicultural characteristics as important as pects of developing successful curriculum.

Also offered for graduate-level credit as CI 543 and may be taken only once forcredit..

## CI 455 -LGBTQ Advocacy In PRE-K-12 Classrooms (1-2)

Provides students with knowledgeand skills to facilitate increased understanding ofothers 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 graduate-level credit as CI 555 and may be taken only once forcredit. . 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 perspectives 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 forcredit. . Prerequisite: Admission into the Secondary Graduate Teacher Education Program(GTEP), the Secondary Dual Endors ement Program(SDEP), or the Bilingual Teacher Pathway (BTP) Program.

## CI 497-Ass essment of Language and Content

 Learning for K-12 English Learners (2)Consider fair, accurate, and meaningful assessment for English learners. Learn about common standardsbased assessment instruments. Examine differences between and uses for assessments measuring language proficiency and content area achievement as they affect ESOL and bilingual student learning.

Explore issues in clas sroom-based assessment of ELLs.

Also offered for graduate-level credit as CI 597 and may be taken only once for credit. . Prerequisite: Admis sion into theSecondary Graduate Teacher Education Program(GTEP), the Secondary Dual Endorsement Program(SDEP), or the Bilingual Teacher Pathway (BTP) Program.

## CI 501 -Res earch (1-9)

(Credit to be arranged.) Consent of instructor.

## CI 550 - Teacher Leadership (3)

Teacher Leadership is a course for educators, particularly K-12 teachers, curriculumdevelopers, 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 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 struggling reader, developing curriculum for 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 as sistants, 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 baseten structure of the numbersystem and 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 fourbasic 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 through examination of studentwork.

## CI 513 -Enhancing Algebraic Thinking: Generalization about Operations (3)

Examine generalizations at the heart ofstudying operations in the elementary grades. Express generalizations in common language and algebraically, develop representation-based arguments, study what it means to prove, and extend generalizations from whole 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)

Discover how patterns lead to functions, learn to read tables and graphs to interpretchange, and use algebraic notation to write rules. With emphasis 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 through examination of student work.

## CI 516 - Exploring Meas urement 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 - Implementing Mathematics Reform (3)

Exploration of worthwhile mathematical tasks provides the context for examining learning, teaching, and assessment. Topics include effective learning environments, strateg ies for planning lessons with a focus on student thinking/understanding, and analysis of materials and resources.

Prerequis ite: Students are required to complete at least four content-focused pedagogy courses..

## CI 519-Mathematics Leadership: Influencing and Facilitating Improvement (3)

Develop an understanding of the role of and the challenges faced by mathematics instructional leaders in their work. Attention to themultiple levels of learning i.e., classroomand the professional learning community within grade-level, building, dis trict, and beyond - each focusing strategies for influencing and facilitating improvement in mathematics instruction.

## 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 classroompractice 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 linguistic variations.

## CI 521 -Practicum: Mathematics Leadership(13)

Enact the varied responsibilities of a mathematics instructional leader, to include: assessing and making recommendations for individual teachers or a school's mathematics program, developing mathematics-focused professional development, assessing and instructing strugg ling or advanced mathematicians, and communicating with stakeholders - always inquiring into how high-quality teaching ensures mathematics success for all.
Prerequisite: CI 519.

## CI 523 -Language Arts in Middle Schools (4)

Designed for teachers 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 ofstudying language through literature and the arts, using writing and speaking to study language, language use in different academic settings and content areas, and emerging trends for studying language in the 21 st 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 atmosphere. Inclusion of state writing standards and peer editing procedures as well
as integrating writing across the curriculumare included.

## CI 525 - Iss ues 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 ofstudent 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 Ass essment for Reading Specialists (3)

This course focuses on the purposes for literacy as essment, types of as sessments, the impact of culture and language on assessment, and the fundamental link between literacy assessment and instruction. Topics include the purposes ofliteracy as sessment tools, the selection of assessments that inform instruction and assessments that inform various stakeholders, the development of a schoolwide assessment program, and an analysis of current assessment practices. The course is designed to develop a more extensive understanding of assessment as it relates to evidence-based literacy instruction, diversity is sues, and students' literacy development.

## CI 529 -School Reading ProgramLeadership (3)

The course is for current or futureadministrators, coordinators, curriculumconsultants, or teachers whose responsibilities will include leadership roles in the administration of school-wide or district-wide reading programs. It deals with long-and short-term objectives, school organizational patterns, staff competencies, materials selection, program evaluation, needs assessment, and the use of community resources.
Prerequis ite: CI 474/574 or equivalent..

## CI 530 - Teaching Struggling Adoles cent Readers

 (3)Designed to help teachers to develop an understanding of adolescent readers within school settings, to expand their teaching repertoire, to as sist struggling readers, and to organize plans that improve
secondary literacy programs. Appropriate for clas sroomteachers, 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-service or 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 curriculum integration of courseware; use of word processing; designing and using computer-based databases in the classroom; 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 organizing for school computer use, hardware selection, computer literacy and technological literacy, and network resources for teachers. Handson 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 CI 433 and may be taken only once for credit. .

## CI 534 -Microcomputer-bas ed Management and Research Tools for Educators (3)

This course introduces educators to important and usefultools for classroom, personal, and professional use: word processing, database, spreadsheet, survey, and statisticalapplications. Each class session includes demonstration and hands-on use of microcomputers. Each student will develop a wordprocessed document, a database, a spreadsheet application, a survey, and a statistical document Expected preparation: CI 432 orequivalent.

Also offered for undergraduate-level credit as CI 434 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 Repres entations 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 reasoning and proving across the mathematical domains. Investigate student conceptions of proof and the appropriate curriculum treatment of topics related to conjecturing, justifying, and generalizing. Design instructional and as sessment 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 ofdevelopmentally and linguistically appropriate strategies and materials to effectively engage EnglishLanguage 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-level credit 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 practiceinforming development of the philosophy of early adolescenteducation, org anizational 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 recenttrends and recurring problems in selecting, organizing, evaluating, and presenting concepts, information, and materials of instruction in subjects taughtin elementary school: art, health, language arts, mathematics, music, physical education, reading (includes one additional field work credit), science, social studies.

## CI 555 -LGBTQ Advocacy In PRE-K-12 Classrooms (1-2)

Provides students with knowledge and skills to facilitate increased understanding ofothers and self around is sues of identity, context, sexual orientation, and gender. Using constructiv ist 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 undergraduate-level credit as CI455 and may be taken only once for credit. . Prerequis ite: upper-division standing..

## CI 561 - Advanced Educational Psychology (3)

Review and developmentofmodern viewpoints in educational psychology with particularattention to theories of learning and their application to school and educational problems; an examination of experimental material that seems mostuseful and relevant to educational psychology.

## CI 565 - Theoretical Models of Curriculum (3)

Study of the history of curriculumand curriculum theory in the United States. Emphas is 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 curriculum development 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 emphas is 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 ofchild development theory, principles, current research, practice ofobservational strategies, and application of growth and development data to educational programs foryoung 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 - Ass essing and Teaching Struggling Elementary Readers (3)

This course focuses on working with elementary students experiencing difficulties in learning to read. It deals with theoretically-basedunderstanding and analys is of students' reading; developing students reading knowledge and strategies; social and psychological as pects of literacy problems. The course includes a field experience in the formof a case study of a struggling reader. Students are responsible for arranging to work with a struggling reader in a school or other setting once or twice a week throughout the quarter.

## CI 580 - Theories of Instruction (3)

An investigation of what happens in the clas sroom, emphas izing the interrelatedness of learning, subject matter, and teaching; testing ofscholars' and the students' own ideas against concrete casestudies of instruction; formulation and defense of one's own theory.

Prerequisite: teaching experience or consent of instructor..

## CI 581 - Iss ues in Education (3)

An introduction to the study of contemporary is sues which impact teaching and learning environments for $\mathrm{K}-12$ students and their teachers. This course is a graduate seminar in which students will identify critical is sues in contemporary education and analyze those issues froma variety of perspectives.
Also offered as CI 681 and may be taken only once for credit..

## CI 590 -Action Res earch Proposal (3)

Designed to help educators see thems elves as researchers so that they can conduct res earch in educational settings that contribute to the improvement ofeducation. 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 Res earch Implementation (3)

Implementation of action research project designed in ECED 590. Discuss issues related to implementation of action res earch project designed in ECED 590. Learn skills to analyze data collected during implementation of action research proposal from surveys, 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: CI590..

## CI 596 -S econd Language Acquisition and Development for K-12 Educators (3)

Gain historical perspectives on language teaching. Study major concepts, theories, research 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 CI 496 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 597-Ass essment of Language and Content Learning for K-12 English Learners (2)

Consider fair, accurate, and meaningful assessment for English learners. Learn about common standardsbased assessment 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 issues in clas sroom-based assessment of ELLs.

Also offered for undergraduate-level credit as CI 497 and may be taken only once for credit. . Prerequisite: Admis sion into theSecondary Graduate Teacher Education Program(GTEP), the Secondary Dual Endorsement Program(SDEP), or the Bilingual Teacher Pathway (BTP) Program.

CI 601 -Res earch (1-9)
(Credit to be arranged.)

CI 602 - Independent Study (1-9)
(Credit to be arranged.)

## CI 603 - Diss ertation (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 history of curriculumand curriculum theory in the United States. Emphas is is placed on the historical, philosophical, and scientific foundations of curriculumtheory. 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 - Iss ues in Education (3)

An introduction to the study of contemporary is sues which impact teaching and learning environments for $\mathrm{K}-12$ students and their teachers. This course is a graduate seminar in which students will identify critical issues in contemporary education and analyze those issues froma variety of perspectives.

Also offered as CI 581 and may be taken only once for credit..

CI 801 - Res earch (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 ofmajor 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 thechanging 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-Interpers onal Communication (4)

Study of communication concepts, processes, and practices in interpersonal 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 relationalsystems, intercultural/interethnic factors.

## Comm 220 -Public Speaking (4)

Research, writing, delivery, and listening skills for oral presentation in a variety of settings, including multicultural. Equal consideration given to speech preparation and delivery with critical thinking, argument forms, and audience analysis emphasized. Issues of speech anxiety addressed.

## Comm 227 -Nonverbal Communication (4)

The study ofnonverbal 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 social environments. Course requirements includecompletion and report of a personal 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 designand 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:Comm 300..

## Comm 312U- Media Literacy (4)

Focuses on building criticalskills for evaluating mass media, going beyond the ways that messages represent the world to the ways that mes sages and the institutions that produce them actually constitute the social world. Primary issues include cultural domination and empowerment;public opinion and the legitimizing role of the media; mass culture and ideology; cultural opposition; the political-economy of news media; and the general role of media in
political socialization. Extensive in-class and smallgroup media analysis.

## Comm 313U- Communication in Groups (4)

Focuses on communication processes in small, decision-making groups. Students examine the relation between actual communicativebehaviors of group members and group structure, functions, and outcomes. Topics include leadership emergence and enactment, quality of problems olving 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- Pers uasion (4)

A consideration of concepts, principles, and theories related to persuasion, and a consideration of the role of persuasivecommunication 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 ofempiricalapproaches 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. Comm316 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 oflife, family or alternative care, education, health and health care, and bas ic human rights are examined. Trends in public awareness, information systems, org anizational 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-stalking and bullying.

## Comm 318U- Family Communication (4)

Focuses on thestudy of families from a communication perspective; that is, how families create, maintain and reinforce patterns of interaction through daily living, story-telling and other habitual forms of communication. Course applies theoretical frameworks such as family systems theory, social construction theory and dialectical theory to issues of courtship and relational development, the changes in the life of families, and family roles.

## Comm 319-S ocial 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 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 advertis ing as an economic 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 businesscontexts. Students will study organizational 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 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 ofenvironmental communication and environmental 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 discourse 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 listening and reading, and speaking and writing) in order to separate myths, assumptions 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 dis cussions 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 communicator behaviors 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 professionalskills, the role of research, and an understanding of common ethical issues encountered.

## Comm 342-Media and Cultural Industries (4)

An overview of the mass media \& cultural industries. Students will examine a range of issues, such as the institutional, social and technological his tories of media and cultural industries, the influence of economic factors in shaping content, and is sues governing regulatory policy. Special emphasis will be given to media's role in society, the concentration of owners hip, the impact of new communication technologies, and increasing convergenceof particular media with one another.

## 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-regional-global 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 platforms peeches, limitedpreparation speeches, interpretive speeches, and team debate.

## Comm 389U - Ethics of Human Communication

 (4)Applies important ethical theories to communication settings and problems, including aspects of interpers onal, 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 th is course to make bettersense 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)

Consentof instructor. Communication Laboratory. 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 (112)

See department for course description. (Credit to be arranged.)

## Comm 405-Reading and Conference (1-12)

Consent of instructor. See department for course description. (Credit to be arranged.)

## Comm 406 -Special Projects (1-8)

Consent of ins tructor. 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: upper-division 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 is sues 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, class, gender in society against thebackdrop ofdebates on multiculturalismin the United States. Examines categorizations of race, class, etc. in theirhistorical,
social, and cultural context, and how thosehave 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. . Prerequisite: upper-division standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 215 ? Introduction to 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-personal communication, 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 ofempiricaldata 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: upper-division 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, politicalnews writing, and political campaigning. The focus is on how communication strategies and media can be used to organize onsent or dissent to ruling parties, representatives, and ideas.

Also offered for graduate-level credit as Comm 520 and may be taken only once for credit.. Prerequisite: upper-divisionstanding. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 322-Mass Comm \& Society orComm 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 thestate and other social institutions.

Also offered for graduate-level credit as Comm 522 and may be taken only once for credit.. Prerequisite: upper-divisionstanding. 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: upper-divisionstanding. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 313U Communication in Groups or Comm 323U Introductionto Organizational Communication.

## Comm 427 -Issues in International Communication (4)

A study of historical and contemporary theories and practices in the conduct oftrans-border communication. Topics may include international communication issues of law, diplomacy, conflict, the Cold War, 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: upper-division 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 promotebehavior change using theories at the individual, interpersonal, small group, and community levels. We will explore the current media environment, in which health communication campaigns canutilize 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: upper-divisionstanding. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 314U ? Persuasion or Comm 329U - Introductionto 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 aspects 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: Upper-divis ion 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: upper-division 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 understanding 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 urban 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: upper-division 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 emphasis 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 messageorigination and interpretation in particular contexts.

Also offered for graduate-level credit as Comm 538 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 218 Interpersonal Communication or Comm313U 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 aspects of gesture, and the contribution of gesture to cognitive and interactive processes of messageorigination and interpretation. Expected preparation: Comm 311 orequivalent; 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 ?non-serious? language and gesture contribute to the creation of meaning and sustaining of relationships in everyday social interactions. Topics vary from quarter 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: upper-division 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 material impacts 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 disasters, 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 Comm 311).
Also offered for graduate-level credit as Comm 545 and may be taken only once for credit.. Prerequisite: Upper-divis ion standing..

## Comm 448 - Iss ues in Science \& Environmental Communication (4)

Centers on how we focus a critical lens on how issues in science and the environment 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 fromsuch is sues 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 sexualorientation in various media (mainstream and 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 haveon people's lives, political decisions and social relations. The overall aim is for students to
understand how their own culturalidentities 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. . Prerequis ite: upper-division standing. . Cross-Listed as: WS 452.

## Comm 460 - 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 graduate-level credit as Comm 560 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 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 issues 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 graduate-level credit as Comm 572 and may be taken only once for credit. . Prerequisite: upper-division standing. Expected preparation: core communication courses and Comm 314U Persuasion..

## Comm 487 - 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 graduate-level credit as Comm 587 and may be taken only once for credit. . Prerequis ite: upper-division 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, 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 broadcastjournalism, advertising and public relations, the Internet, and entertainment media.

Prerequis ite: junior, senior or graduate standing..

## Comm 501 - Research (1-9)

Consentof 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 (19)

See department for course description. (Credit to be arranged.)

## Comm 505 - Reading and Conference (1-9)

Consentof 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 pers pectives 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 ofmass communication.

Also offered for undergraduate-level credit as Comm 412 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 Communication \& Society..

Comm 513-Seminar: Communication in Ins titutional Contexts (4)
Various configurations and features of institutional life are examined. The impact of culture, politics, media on organizational communicative structures and processes, communication consultation, institutional-community interface are among the topics covered. Current research is examined. Students conduct an organizational res earch project.
Prerequisite: graduatestanding or instructor permission. Repeatable for credit..

Comm 514-Topics in Communication, Culture, and Community (4)

Examination and analysis of human symbolic activity as the management ofmeaning, with the capacity to
shape and influence thought, action, and world view. Particular attention given to as sumptions 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 is sues 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, class, gender in society against the backdrop of debates on multiculturalismin the United States. Examines categorizations of race, class, etc. in their historical, social, and cultural context, and how thosehave 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-level credit as Comm 415 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 215 ? Introduction to Intercultural Communication. .

## Comm 516-Communicating Environmental Controversies (4)

With a special emphasis on environmental extremes and controversies, this course explores how everyday 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 Comm 416 and may be taken only once for credit..

## Comm 518 - Advanced Interpers onal Communication (4)

Theory course in which students analyze current concepts and theories related to inter-personal communication, 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 interpers onal communication is analyzed through evaluation of empirical data and general cultural texts. Research project required.

Also offered for undergraduate-level credit as Comm 418 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. .

## 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, politicalnews writing, and political campaigning. The focus is on how communication strategies and media can be used to organize onsent or dissent to ruling parties, representatives, and ideas.
Also offered for undergraduate-level credit as Comm 420 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 or Comm 314U Persuasion. .

Comm 521 -Quantitative Methods in Communication Research (4)

An examination of the methods of quantitative empirical research in communication. Emphasis is upon selected research designs, data collection and analys is, data input for computer analysis 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 Comm 422 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 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 org anization and informal communication channels, organizational culture, and strategic communication. Course requirements include completion and report of a res earch project.

Also offered for undergraduate-level credit as Comm 423 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 313U - Communication in Groups or Comm 323 U - Introduction to Organizational Communication. .

## Comm 525 - International Communication and Culture (4)

Study and analysis of the international dimensions of communication. Focus is on understanding the cultural and power contexts and differences among and between peoples and institutions that establish the boundaries in the exchange of meanings, values, and ideas. Emphasis is given to questions of cultural, economic and politicalsovereignty 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 issues 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 undergraduate-level credit as Comm 427 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 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: graduatestanding or permission of instructor..

## Comm 529-Health Communication Campaigns

 (4)In-depthexamination 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 canutilize a variety of communication channels including mobile phones, social networks, video games, and entertainment television.
Also offered for undergraduate-level credit as Comm 429 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 assumptive bases. Particular attention given to descriptive, interpretive, and criticalapproaches for analysis, and to specific methods of participant observation, interviewing, and textual analys is. Critical examination of selected research as models for original studentres earch.
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 Comm 432 and may be taken only once for credit. .

## Comm 533 -Seminar: Organizational Communication (4)

Examines the implications ofevolving perspectives in organizational theory, as well as cultural factors which may influence communication processes in the organizational context. Different approaches to assessing organizational communication processes are considered with relevance to enhancing organizational effectiveness and facilitating organizational transition and change. Course requirements includecompletion and report of a research project.

## Comm 536-Communication and Cognition (4)

Exploration of human communication froma cognitive perspective.
Also offered for undergraduate-level credit as Comm 436 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).

## 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 understanding the role of communication in structuring sociallife in urban environments. Relevant theories onurban life and multiple dimensions 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-level credit as Comm 437 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 emphasis 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, issues of common ground and relevance, and cognitive processes of messageorigination and interpretation in particular contexts.

Also offered for undergraduate-level credit as Comm 438 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 emphas is on informal settings, interaction of gesture with language, metaphorical aspects ofgesture, and the contribution of gesture to cognitive and interactive processes of message origination and interpretation. Expected preparation: Comm 311 orequivalent; upper-division or graduate standing.
Also offered for undergraduate-level credit as Comm 439 and may be taken only once for credit. .

## Comm 540 -Metaphor, Play, and Humor (4)

How metaphor, play, humor, and other forms of ?non-serious? language and gesture contribute to the creation of meaning and sustaining of relationships in everyday social interactions. Topics vary from quarter 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-level credit as Comm 440 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 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 criticismexamined, along with exemplars for analysis. Specialattention 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 ofrisk communication, with a focus on strategic communication. Fromhealth crises to earthquakes to environmental disasters, 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.

Also offered for undergraduate-level credit as Comm 445 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 - Iss ues in Science \& Environmental Communication (4)

Centers on how we focus a criticallens on how issues in science and the environment 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 fromsuch issues as childhood vaccines to the discovery of ancient mummies.

Also offered for undergraduate-level credit as Comm 448 and may be taken only once for credit.

## 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 haveon 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.
Also offered for undergraduate-level credit as Comm 452 and may be taken only once for credit. . CrossListed 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 graduate credit.
Prerequisite: graduatestanding..

## Comm 560 - Framing and Mass Media (4)

Examines how messages are constructed and the effects frames haveon 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 Comm 460 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 issues 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 Comm 472 and may be taken only once for credit. . Prerequisite: upper-division standing. Expected preparation: core communication courses and Comm 314U 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-level credit as Comm 487 and may be taken only once for credit. . Prerequisite: 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 understandingethical dilemmas commonly encountered by media professionals and help in making theory-grounded decisions in print and broadcast journalism, advertis ing and public relations, the Internet, and entertainment media.

Prerequisite: junior, senior or graduate standing..

## COTA - College of the Arts

## COTA 135-Artist as Citizen: A Survey of Art

 Activis m (2)Examines art activismand the artist's role in pursuing social change. Through reflection on their own values, beliefs, and artistic agency, as well as
studying a broad spectrum of artistic engagementfrom grass roots creativity to global celebrity culturestudents will gain an understanding of the ways that artists engage with communities, and address contemporary is sues in society. Guests will vis it through the term to share their work and discuss art activismin practice.

## COTA 199 -Special Studies (1-8)

(Credit to be arranged.)

## COTA 335 - Artist as Citizen: Engage in Art Activis m(2)

Provides a hands-on, community-based experience that delves into the process of artistic activism. Students will collaborate with their peers, and artsrelated community partners and engage with K-5 public schoolstudents to examine social-justice is sues, and createand share artistic res ponses that reflect these is sues. In the process, examining their roles as both artists and socially eng aged 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 Classroom Teacher (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 orteaching 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 major psychiatric disorders. Emphasis is placed on both the traditional medical model and on the psychosocial model of diagnosis. Developmental aspects associated with normal and abnormal personalities will also be dis cussed. This course is a prerequisite forthe 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 issues and new developments in the treatment of substance abusing clients. Emphasis is on new knowledge fromresearch and current trends in treatment with particular focus on the interface between chemical dependency and mentalhealth.

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 with in 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-at-risk. Emphas is will be placed on identifying youth-at-risk for depression, suicide, eating dis orders, pregnancy, AIDS, use and abuse of alcohol and drugs, homelessness, gang members hip and several other at-risk behaviors. Ideas for primary, secondary and tertiary prevention fromindividual, family, school and community perspectives will also be presented. Particular attention will be paid to guidelines fordevelopment 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 graduate-levelcredit 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 to Support Infants and Toddlers (1-3)

Development and maintenance ofeffective 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 ofdifferent systems fromthe perspective of family and community.

## Coun 525-Guidance for the Classroom Teacher (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 orteaching 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 classroom climate 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 completea work sample. Students are expected to complete two credits per termduring one school year fora totalof six credits. Restricted to students admitted to thetrack II school counselor specialization.

## Coun 527 -Counseling Individuals with Diverse Needs (3)

Designed to prepare counselors to provide collaborativeservices 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, transitional 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 ofthe majorpsy chiatric dis orders. Emphas is is placed on both the traditional medical model and on the psychosocial model of diagnosis. Developmental aspects associated with normal and abnormal personalities will also be discussed. This course is a prerequisite for the Counselor Education graduate programs and will not be credited toward the completion ofthe degrees.
Also offered for undergraduate-level credit 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 spiritualdimensions of substance use disorders. Emphas izes 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 treat
clients 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 assessment and diagnosis of psychoactive substance use disorders. The elements of the biopsychosocial as sessment process, including basic interviewing and motivational interviewing skills, will be reviewed, as well as standardized screening and as sessment instruments for chemical dependency.

## Coun 533 - Treatment of Substance Use Dis orders 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 ofsubstanceusedisorder treatment along with the efficacy and indications of each modality. This is the first course in a sequence of two: 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 theknowledgeand skills ofsubstanceuse dis order treatment for diverse client populations. Includes HIV/infectious diseases and how to complete a risk assessment. Examines the ethical and professional is sues involved in addictions counseling. Focuses on practicalskills including documentation, treatment planning, and clinical interventions. This is the second course in a sequenceoftwo: Coun 533, Coun 534 and must be taken in sequence.

Prerequisite: Coun 533..

## Coun 535-Co-Occurring Dis orders (3)

Focuses on helping individuals who suffer from cooccurring 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 complex population.

Prerequisite: Coun 531..

## Coun 536 - Addictions Couns eling Caps tone (3)

Merges theoretical components of addiction treatment with practicalapplications. 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 Is sues in Addictions Counseling (3)

Presentation of current issues and new developments in the treatment of substance abusing clients. Emphasis is on new knowledge fromresearch and current trends in treatment with particular focus on the interface between chemical dependency and mentalhealth.

Also offered for undergraduate-level credit as Coun 437 and may be taken only once for credit..
Coun 541 - Introduction to Couns eling (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 for credit.

## 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 -Cons ultation: 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 student group presentations.

Prerequisite: graduatestanding..

## Coun 545 - Youth at Risk (3)

Designed to provideparticipants with an overview of information focused on counseling and teaching youth-at-risk. Emphas is will be placed on identifying youth-at-risk for depression, suicide, eating dis orders, 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 fromindividual, family, school and community perspectives will also be presented. Particular attention will be paid to guidelines fordevelopment 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-level credit 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 issues.

Prerequisite: graduatestanding..
Coun 547 -Legal \& Ethical Iss ues in School Counseling (1)
Focus on the legal and ethical considerations specifically related to the practice of school counseling. Class time will include lecture/discussions, experiential exercises, and completion of case vignettes related to common legal and ethical issues.

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. Theemphasis 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 prerequis ite 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 dimensions: (a) human nature, (b) pathology, and (c) treatment. Focus will also be on conceptually applying each theory to client cases. Completion of Coun 551 is a prerequis ite for this class.

## Coun 553 - Advanced Therapeutic Strategies (3)

Focuses on advanced interventions for clients seeking personal counseling. Emphasis is focusedupon cognitive-behavioral, brieftherapy, 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 practicum of 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 level introduction to testing. It offers the student the option of test usage in the counseling process and introduces is sues related to such usage. In addition, the course acquaints the student, through hands-on 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: admission to the programand Coun 541..

## Coun 569 -Developmental Foundations of Counseling (3)

Theoretical overview of life-span growth and development, emphasizing cognitive-intellectual, cognitive-moral, emotional-self, and social as pects of developmental growth in the human being. Emphas is on translating theory into practice through a "personenvironment interaction" conception of counseling, consultation, and educational 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 ethicalstandards of the American Counseling Association, the American Ps ychological Association, and related professional organizations. 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 is sues; child and adolescent clients; family and group counseling; evaluation, testing, and diagnosis; supervision and consultation, conducting research and methods of resolving ethical and legal is sues.

## Coun 571 - Group Counseling (3)

This course is designed to providestudents with opportunities to learn about group counseling theories and skills. Particularemphasis 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 provideparticipants 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 assisted 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 pres entations, participant self-evaluation of their own 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 thesesystems,
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 anddysfunction as related to tasks and challenges of reorganization 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 res is tance 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 pers onal/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 prerequisite for this course; the emphasis here will be on application of theory and the development of family therapy skills. Experientiallearning (role plays) will occur during class, with participation required from all 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 analyzes current therapeutic as sessment tools and interventions grounded in systemic theory/research as theypertain to family transitions. Success in this course builds upon requisitemastery of major systemic concepts thathave to do with systemic function, structure, and motivation as related to as sessing similarities and differences between normative and paranormative marriage and family life transitions. Appropriate systemic as sessment integrates with systemic therapeutic interventions in res olving cris is 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 provision of counseling services to culturally diversestudents and otherclients 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 Program Evaluation in Counseling (3)

Covers the areas of research design, basic psychometric principles and statistical procedures, test/scale construction, needs assessment, program
evaluation, 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 providestudents with a solid understanding of job placement principles, practice and knowled ge 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 crisis as essment and intervention in a variety ofsettings. Course content includes the types of crisis situations many counselors experience, including suicidal clients, clients who are victims of abuse orneglect, and potentially homicidal clients. Students will learn and practice strategies for assessing risk level, minimizing potential liability, and promoting client safety.

## Coun 585-Diagnosis andTreatment Planning I (3)

First in a sequence of two courses introducing students to the diagnosis and treatmentof psychiatric 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 dis orders 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 leg is lation; organization and delivery ofmental health services at
the federal, state, and local levels; influences and trends in service delivery.

Prerequisite: 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 disorders, as outlined in the current Diagnostic and Statistical Manual.

## Coun 589 - Action Res earch in Couns eling (1-2)

Des igned 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 profession of rehabilitation counseling with an emphasis on both theoretical and practical aspects of the field.
Prerequisite: Psy 534 or Coun 541..

## Coun 591 - Medical Aspects of Dis ability (3)

Covers the mostcommon physical, sensory, and mentaldis abilities encountered by the rehabilitation professional. The major symptomatology, diagnostic procedures, treatment modalities, functional implications, and psychosocial and vocational correlates of each disabling condition will be discussed.

Prerequisite: Coun 590..

## Coun 592 - Ps ychos ocial Aspects of Disability (3)

Covers the psychological and social aspects 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 dis abilities 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, assessment, goal setting, plan development, intervention strategies, case monitoring, inter-agency coordination, advocacy, promotion ofself-advocacy by client, software systems, information flow, organizational 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 bas ic principles and imperatives of occupational analys is 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 personal 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 ofrehabilitation theories, technologies, as sessment procedures, and counseling modalities, to a variety of rehabilitation settings and across rehabilitation populations.

## Coun 596 -Foundations of School Counseling (3)

Foundational course fors tudents 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 aspects of comprehensive school counseling programs. Field study required.

## Coun 597 -Strengths, Risk Factors, and Disturbance in Infants, Toddlers, and Their Families (3)

Focus on infants, toddlers, and their families and how they copesuccessfully with life tasks and external stres sors. Examination of what happens when coping breaks down and problems emerge in families with
young children. Students will(1) identify relevant streng ths and resiliency factors for infants, toddlers, and their families; (2) understand developmentally relevant risk factors, especially parentalmental health issues, and their potential impact on infants, toddlers, and their families; and (3) gain knowledge ofmajor forms of psychopathology within infant/toddler mentalhealth.

## 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 (19)

(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 (09)

(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 purposeofthis 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 from quantitative, qualitative, and epidemiological methods, with particular attention paid to statistical significance and clinically meaningfuloutcomes. Students will trans form their own clinical
inquisitiveness into practice-based researchable questions and focus on the application of res earch 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.. Prerequisite: Statistics.
CPH 515-Geographic Information Systems for Public Health (3)

Public health practitioners track population data to plot dis ease trends and associated patterns of social and biological determinants 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 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 underlying 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 trans late 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 onlinecourse. 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 as pires 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 seefirsthand 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 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 increas ing risk of data being mis unders tood, misused or poorly interpreted. Thus we havea 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 forhealth 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 datato 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 globalhealth dis parities. Current trends in global health will be described and dis cussedutilizing 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 increasedunderstanding of the complexities associated with global health disparities, interventions and reliefefforts, 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 olderpersons 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 fhealth and survival; distinctions between normal aging, dis ease 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 teamleadership. Is sues 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 dis cussed. 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 overtheoretical derivations. Students will learn how to use a computer package for data analys is, and how to interpret the results of data analyses. Homework assignments and exams will address conceptual, methodological and data analytic issues.
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 with in 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 cutacross 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 severalkey 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 Councilon 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 forpublic use; pitfalls of policymaking; and the ethics 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 635..

## CPH 536 -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, use of innovative problemsolving approaches and useofmultiple methods ofdata collection. Topics include community theory, development strategies, promis ing 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 bas ic 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 producehealth-related behaviorchange are examined.

## Also offered as CPH 637..

## CPH 538-Public Health Program Evaluation (3)

Using case study methodology, this course focuses on the acquisition of technical skills in design, data collection and analysis for the purpose of evaluating public health programs. Programjustification and evaluation for policy-making purposes will be emphasized. In addition, alternative forms of evaluation will be examined including rapid assessment, participatory evaluation and historical, social networking and other techniques. Students will have the opportunity to examine public health data sets and to design an evaluation focused ona disparate population as well as develop policy based on critical analysis of several types of evaluations.
Also offered as CPH 638.. Prerequis ite: 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 SchoolofPublic Health to the fundamental concepts of theory and practice in environmental public health. Students will become familiar with principles of hazard identification, exposure assessment, 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 thebuilt environment.

Also offered as CPH 639..

## CPH 550 - Public Health ProgramPlanning (3)

This course provides an introduction to program planning and experience in the grant writing process, with an emphas is on public health intervention programs. Students will be introduced to program planning, 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 - Res earch 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 from quantitative, qualitative, and epidemiological methods, with particular attention paid to statistical significance and clinically meaningful outcomes. Students will transform 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 dis playing 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 disease trends and associated patterns of social and biological determinants 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 based on tutorials and case studies. Students interested in a strong understanding of underlying 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 "get under our skin"? Why and how socioeconomic inequalities translate into biological outcomes thus shaping heath inequalities? What are the drivers of population health and whatcan 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 as pires that students translate academic contents into public health practice. To thatend, 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 assessmentcould lay the basics for culturally and economically congruentinterventions/policies to mitigate health problems.

Also offered as CPH 521..

## CPH 622 -Communicating Public Health Data (3)

Traditionally, public health findings and surveillance data are disseminated through publications and reports designed for the academic and scientific community. Today, with growing access to public health data forthe general population, there is also the increas ing risk ofdata being misunderstood, misused or poorly interpreted. Thus we havea 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 forhealth 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 conceptof "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 datato 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 as sociated 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 olderpersons 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 resolution, building collaborative teams, and providing teamleadership. Issues ofmeasuring, 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 dis cussed. 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 theextent needed for students to understand the models and methods, the course will emphas ize 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 issues.

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 cutacross 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 531..

## CPH 635 - Professionalism, Ethics \& Sys tems 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 legaland 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. 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-term commitment 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 useofmultiple methods of data collection. Topics include community theory, development strategies, promis ing 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 dis ease. 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)

Us ing case study methodology, this course focuses on the acquisition of technical skills in design, data collection and analysis for the purpose of evaluating public health programs. Programjustification and evaluation for policy-making purposes will be emphasized. In addition, alternative forms of evaluation will be examined including rapid as sessment, participatory evaluation and his torical, social networking 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 analys is 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 OHSUPSU School ofPublic Health to the fundamental concepts of theory and practice in environmental public health. Students will become familiar with principles of hazard identification, exposure as essment, 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.
Corequisite: Als o offered as CPH 539..

## CPH 650 - Public Health Program Planning (3)

This course provides an introduction to program planning and experience in the grant writing process, with an emphas is on public health intervention programs. Students will be introduced to program planning, 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 trans forming human interactions, especially social discourse and communication, from"calling out" to "calling in." Covers techniques developed by nonviolent actionists, 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 from community to county to state to national and transnational are successful or not in large part due to the quality of mes saging. Us ing interdisciplinary principles from Conflict Resolution, Communications, Ps ychology, and Writing (English), students develop frameworks and messaging techniques to advance campaign goals by affecting influencers.

## CR 299 - Special Studies (1-5)

(Credit to be arranged.)

## CR 301 U - Introduction to Conflict Resolution (4)

Introduces conflict resolution studies. Explores both the nature of conflict and our understanding of what resolution seeks to achieve. Emph as izes 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 fromcommunity 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 leaderbiographies.

## CR 303U- Consens us Building (4)

Competency development in seeking, building, and achieving consensus decisions in organizations 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 res ource 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 analysis of methods of nation-stateconflict management, using the US as the case example.

## CR 306U-Nonviolence: History and Campaign Design (4)

This course examines nonviolence fromseveral perspectives, includingunits 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, cons ensus building, mediation, conflict analysis, conflict mapping, de-escalation, negotiation, conflict management systemdesign, community organizing, conflict management careers. Theory, simulations, and student teampres entations generatenew competencies and evaluative opportunities.

## CR 310U- Conflict Res olution 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. Professional ethical issues
and other dilemmas in conflict resolution practice are also studied.

## CR 311U- Conflict Res olution Ps ychology (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 resolution explored through intercultural communication theory, and through study of its relationship to processes of conflict and outcomes of resolution. Considers how intercultural conflict resolution operates within ourselves, among our selves, and in the personal, professional, and world-at-large through dialogue, interaction, and the creative arts.

## CR 313 - Environmental Conflict Res olution (4)

Critically examines conflict resolution principles and practices as applied to environmental conflicts. Explores the conflict between the duty to protect the environmentagainst 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 from US culture and politics, students will learn how conflict resolution strategies can soften divis ions 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 trans formation 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-level credit 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 theevolution 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-levelcredit as CR 520 and may be taken only once for credit. . 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 dimensions of peace and conflict resolution efforts. Dialogue crosses disciplines, creating a common thread through the many dimensions of peace work.

Also offered for graduate-levelcredit as CR 523 and may be taken only once for credit. . Prerequis ite: upper-division standing..

## CR 427 - Nationalis mand 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 historical roots, evolution, structural patterns and socio-political antecedents and consequences.

Also offered for graduate-level credit as CR 527 and may be taken only once for credit. . Prerequisite: Upper-divis ion standing..
CR 428 - Human Values in War and Peace: Value Dilemmas, Contradictions and Res olutions (4)

Critically reflects on how similarly or differently values and beliefsystems 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 forgraduate-levelcredit as CR 528 and may be taken only once for credit. . Prerequis ite: upper-divisionstanding..

## CR 429 - European Union as a Peacebuilding System(4)

Interdisciplinary focus on the European Union as an inter- and trans -national systemofconflict resolution and peace building. Examined by contrasting the
nationalistconflicts of old Europe to post-warefforts in building a systemofpeace and security that transcends belligerent ethnocentric nationalism.
Also offered for graduate-level credit as CR 529 and may be taken only once for credit. . Prerequisite: upper-division standing..

## CR 439 -Family Mediation (2)

In cases of divorce and custody Oregon State Law encourages/mandates the useofmediation. 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 CR 539 and may be taken only once for credit. . Prerequisite: upper-division standing..

## CR 440 - Peer Mediation (2)

Overview of programs in the schools where youth serve as mediators to resolve conflict 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 resolution skills and analyze conflict dynamics of race and oppression.
Also offered for graduate-level credit as CR 540 and may be taken only once forcredit. . Prerequisite: upper-division standing..

## CR 441 -Storytelling and Conflict Res olution (4)

Storytelling plays a role in limiting, creating and sustaining creative conflict resolution. Critical thinking and deliberate analysis used to deconstruct the grand narratives of dominant dis course, explore counter narratives emerging from the margins, and examine how resolution - and social change - has surfaced as a result.

Also offered for graduate-level credit as CR 541 and may be taken only once forcredit. . 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 effectiveconflict resolution education.
Also offered for graduate-level credit as CR 542 and may be taken only once for credit. . Prerequisite: upper-division standing..

## CR 443 - Nationalism and Democracy in a Post9/11 World(4)

Examines the rise of American nationalismin the aftermath of9/11 and its impact on America's relationship to the world. Froma peace and conflict studies perspective, the narrative of American nationalismis investigated in contrast to the narrative of American democracy, examining implications for war and peace.
Also offered for graduate-level credit as CR 543 and may be taken only once forcredit. . 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-levelcredit as CR 544 and may be taken only once for credit. . Prerequis ite: upper-division standing..

## CR 445 - Gender and Conflict Res olution (4)

Explores the social construction ofgender and its impact on conflict. Psychological theories, violence and aggression, communication styles, culture, societals tructures, 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-levelcredit as CR 545 and may be taken only once for credit. . Prerequisite: upper-division standing..

## CR 446 - Human Rights and Conflict Resolution

(4)

Key actors and core elements to promotinghuman rights as a conflict resolution mechanismaround the world.

Also offered forgraduate-level credit as CR 546 and may be taken only once for credit.. Prerequisite: Upper-divis ion standing..

## CR 447-Civil Society and Conflict Resolution (4)

Explores the multi-faceted conflict resolution roles of civil society and non-governmental actors 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.. Prerequis ite: Upper-division standing..

## CR 448 -Transitional Justice and Peacebuilding

 (4)Transitional justiceas 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 forcredit.. Prerequisite: Uppder-division standing.

## CR 449 - Intro to Holocaust and Genocide Studies

 (4)Introduction to Holocaust and Genocide Studies presents the his torical context of the Holocaust, including timelines andevents, 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, andstudents 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, Hst380U, JSt 380U, or BSt 214.

## 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 -SelectedTopics (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 thehumanities and social sciences. A particular focus will be given to the legal and ethical aspects ofthese models, along with a full exploration of legalities and professionalethics 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 andethics in the field of conflict resolution. The course also examines the impact of conflict resolution on theory and practical philosophy.

## CR 514-Conflict Resolution in Divergent Settings (4)

Examination of the variety of settings where conflict resolution takes place. Guest speakers share their experience and theoretical insights.
Prerequisite:CR512, 513..

## CR 515-Negotiation (4)

Introduction to collaborative approaches to responding 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 analys is, communication skills, maintaining a neutral role, creating a safe environment, and ensuring procedural, substantive and psy chological satis faction. 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 politicalrhetoric, creating a dangerous "us and them" dichotomy, and making reconciliation across cultures and viewpoints nearly impossible.

Also offered for undergraduate-level credit as CR 416 and may be taken only once for credit..

CR 517 - Nonviolence (4)
Designed to acquaint students with the theories and history of nonviolence fromancienttimes 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 ins ights 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. Emphas is on how forgiveness and atonement informconflict resolution practices.
Also offered for undergraduate-level credit as CR 419 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 historicalwounds, memory, accountability, acknowledgment, restitution, forgiveness and truth. Case studies provide a focal point for class discussions and analysis.
Also offered for undergraduate-level credit as CR 420 and may be taken only once for credit..

## CR 522 - Thesis and Project Preparation Seminar (4)

Introduction to the culminating requirement of the CR graduate program distinguishes between the two options: thesis and project. Students discuss the different goals, activities, processes, and outcomes of the two options and review theses and projects written by predecessors.

Prerequis ite: Admis sion to graduate program.

## CR 523 - Dialogue Across Differences (4)

An exploration of the theory and practiceof 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 CR 423 and may be taken only once for credit. . Prerequisite: upper-division standing..

## CR 524 - Advanced Mediation (4)

Focus on the qualities of the practitioner that enhance the practice of mediation. Thepractice of mediation involves a particular kind of presence, that of a nonjudgmentalobserver. 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 these qualities through the cultivation of mindfulness. Recommended prerequisites: CR 515.

## CR 525 - Conflict Resolution Systems Design (4)

Acquaints the student with a systems approach to designing conflict resolution services. These services are des igned for a wide variety of settings to handle conflicts effectively at the lowest cost. Students learn to diagnoseand 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 cultural similarities or difference might influence the conflict resolution 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. Issues of power and marginality as they relate to dynamics of culture will be explored. Students explore and learn from other cultures and apply this learning in the evaluation and use of conflict resolution paradigms.

## CR 527 -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 historical roots, evolution, structural patterns and socio-political antecedents and consequences.
Also offered for undergraduate-level credit 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 andbelief 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-level credit as CR 428 and may be taken only once for credit. .

## CR 529 - European Union as a Peacebuilding System(4)

Interd isciplinary focus on the European Union as an inter- and trans-national system of conflict resolution and peace building. Examined by contrasting the nationalistconflicts of old Europe to post-warefforts in building a systemof peace and security that transcends belligerentethnocentric nationalism.
Also offered for undergraduate-level credit as CR 429 and may be taken only once for credit. .

## CR 530 - Research and Professional Development Colloquium (1-4)

Graduate students meet in a collaborative environment in order to learn fromeach other, from faculty members, from community partners, and from other experts and practitioners in the field of conflict
resolution. Each week, presentations, dialogue, and case exploration will offer real-time learning about current issues 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 539 - Family Mediation (2)

In cases of divorce and custody Oregon State Law encourages/mandates the useofmediation. 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 CR 439 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 res olve conflict 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 resolution skills and analyze conflict dynamics of race and oppression.
Also offered for undergraduate-level credit as CR 440 and may be taken only once for credit. .

## CR 541 - Storytelling and Conflict Res olution (4)

Storytelling plays a role in limiting, creating and sustaining creative conflict resolution. Critical thinking and deliberate analysis used to deconstruct the grand narratives of dominant dis course, explore counter narratives emerging from the margins, and examine how resolution-and social change - has surfaced as a result.

Also offered for undergraduate-level credit as CR 441 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 effectiveconflict resolution education.
Also offered for undergraduate-level credit as CR 442 and may be taken only once for credit. .

## CR 543 - Nationalism and Democracy in a Post9/11 World(4)

Examines the rise of American nationalismin the aftermath of $9 / 11$ and its impact on America's relationship to the world. Froma peace and conflict studies perspective, the narrative of American nationalis $m$ is investigated in contrast to the narrative of American democracy, examining implications for war and peace.
Also offered for undergraduate-level credit 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 ofdomestic, 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-level credit as CR 444 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. Psychologicaltheories, violence and aggression, communication styles, culture, societal structures, conflict resolution paradigms and war and peacebuilding are analyzed. Examines micro and macro issues connected to gender, peace, conflict and violence.

Also offered for undergraduate-level credit as CR 445 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-level credit as CR 446 and may be taken only once for credit..

## CR 547 - Civil Society and Conflict Resolution (4)

Explores the multi-faceted conflict resolution roles of civil society and non-governmentalactors in helping societies experiencing strife, rebuild, manage and prevent conflict.

Also offered for undergraduate-level credit as CR 447 and may be taken only once for credit..

## CR 548 - Transitional Justice and Peacebuilding (4)

Transitional justice as legal and non-legal initiatives to bring closure, healing, and reconciliation after tragedies.
Also offered for undergraduate-level credit as CR 448 and may be taken only once for credit. Prerequis ite: Upper-division 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 them to 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 research interests, and/or their career goals that incorporate learning from cours ework. This course may be taken forcredit up to two times.

Prerequisite: CR 546, GRN 520, and 8 approved elective credits..

## 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 dis cussed and compared. Software is the primary focus of the course. Themain topics are system software(Windows, OS X, etc) and applications (such as browsers, word processors, spreadsheets, presentation graphics and database
managers ). The course concludes with discussions concerning legal and ethical issues 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 problem definition and requirements gathering, generating a description of a step-by-step solution (the algorithm), writing a program, testing, and documentation. The programming language Visual Basic is used; several programming projects are completed during the term. Expected preparation: high school algebra, knowledge of Windows and the ability to use Windows Explorer.

## CS 107-Computing Fundamentals III (4)

Introduction to Web programming and associated web tool usage for non-CS majors. Centering around the more sophisticated aspects of browsers. Web pages thatrepresent the input to browsers are defined. In-depth study ofHTML, VBScript and JavaScript. Brief exploration into CGI Scripts and otherserverside tools. Course differentiates between W eb page design (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 Problem-Solving (4)

Introduction to fundamental concepts of computer science. Problem solving, algorithmand program design, data types, loops, control structures, subprograms, and arrays. Learn to write programs in a high level programming language. Surveys current social and ethical aspects of computer science. Recommended prerequisite: Mth 111.

## CS 161L- Introduction to Programming and Problem-Solving 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 thesyntax of $\mathrm{C}++$ to students who already know how to program. Students are expected to be proficient at using conditionals, I/O, loops, and functions with arguments. Topics include: conditionals, I/O, files, functions, classes, pointers, dynamic memory, linear linked lists, and multi-dimensional arrays in $\mathrm{C}++$, as well as programcorrectness, verification, and testing. Three hours lecture and one 3-hour laboratory. The laboratory emphasizes practical programming skills.

Prerequisite: Prior programming experience equivalentto CS161..

## CS 163 - Data Structures (4)

Data abstraction with formal specification. Elementary algorithmanalysis. Basic concepts of data and its representation ins ide 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. Three hours lecture and one 3-hour laboratory. The laboratory emphasizes practical programming skills.

Prerequisite: CS 162 with a grade ofC or 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 froma software perspective. Topics include: Basic machine organization, Sys temprogramming using C and as sembly language, Introduction to system programming 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, System calls, File I/O, Timing and improving program performance, Introduction to memory hierarchy, dynamic memory allocation techniques.
Prerequisite:CS 162.

## CS 202 -Programming Systems (4)

Students will become familiar with the language and operating systemenvironment used in most upper division courses in the Computer Sciencemajor curriculum. Use of the file system, operating-system calls, and shell-level programming; low-level debugging of high-level programs. Programming exercises will include applications fromdata structures (e.g. B-trees) and memory management techniques.

Prerequisite: CS163.. Corequisite: CS 202L.
CS 202L-Lab for CS 202 (0)
Lab for CS 202.
Corequisite: CS 202.

## CS 250 - Dis crete 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 ofCS 250. Logic: propositional calculus, first-order predicate calculus. Formal reasoning: natural deduction, res olution. Applications to program correctness 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 300 - Elements of Software Engineering (4)

Practical techniques of programdevelopment for medium-scale software produced by individuals. Software development from problemspecification through design, implementation, testing, and maintenance. The fundamental design techniques of step-wis erefinement and data abstraction. A soft ware project will be carried through the development cycle.

Prerequisite:CS 163, 201, 202.

## CS 300L- Elements of Software Engineering Laboratory (0)

Lab for CS 300 Elements of Software Engineering

## CS 305 -Social, Ethical, and Legal Implications of Computing (2)

History of computing, social context of computing, professional and ethical res ponsibilities, risks and liabilities of safety-critical systems, intellectual property, privacy and civilliberties, 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 ofthe basic principles of computer game design, the most populartechniques and technologies for game implementation, focusing on the many ways in which advances in artificial intelligence influences game design.

Prerequisite: Prior computer programming experience equivalent to CS 163..

## CS 320 - Principles of Programming Languages

(4)

Syntaxand semantics. Compilers and interpreters. Programs as data. Regular expressions 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 202 and CS $251 .$.
CS 333 - Introduction to Operating Sys tems (4)
Introduction to the principles ofoperating systems and concurrent programming. Operating system
services, file systems, res ource 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 dis cretestructures with applications to computing problems. Topics include sets, relations, functions, counting, graphs, trees, recursion, propositional and predicate logic, proof techniques, Boolean algebra. The course may not be used as part of the degreerequirements 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 interneton popular culture. Graduates of the course will become more intelligent and successfulusers 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 his tory 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.
Prerequisite: Sophomore Inquiry:Popular Culture (UNST 254)..
CS 345-Cyberculture: The Internet and Popular Culture (4)
Study of the effect of computers and the interneton popular culture. Graduates of the course will become more intelligent and successfulusers 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 his tory and technologies of the web, social networks, the long tail in business and culture, thepower 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 organize themselves to produce complex behavior, use information, and adapt and learn. Focuses on common principles underlying 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-divisionCS Electives for the BS degree in Computer Science. This course is thesame as SySc 346; coursemay 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 theimpact the Internet has had on society as well as potential threats to its continued success. The course may notbe used as one of the upper-divisionCSElectives 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 technical limitations, copyright and digital rights management, and digital media communications. The course may not be used as an upper-division CS Elective for the BS degree in Computer Science.

## CS 350 - Algorithms and Complexity (4)

Techniques for the design and analysis of algorithms. Case studies of existing algorithms (sorting, searching, graph algorithms, dynamic programming, matrix multiplication, fast Fourier transform.) NPCompleteness.
Prerequisite:CS 250 and CS 251..
CS 399-Special Studies (0-6)
(Credit to be arranged.) Consent of instructor.

CS 399L- Lab for CS 399 (0)
Lab for CS 399 specialstudies.

## 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 ins tructor.

## CS 410 - Selected Topics (1-6)

(Credit to be arranged.) Consent of ins tructor.

## CS 410L-Selected Topics Lab (0)

Lab for CS 410.

## CS 410P - SelectedTopics (1-6)

Programming intensive version of CS 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, message-passing programming, performance models and analysis techniques, domain-s pecific parallel algorithms.

Also offered for graduate-level credit as CS 515 and may be taken only once forcredit. . Prerequisite: CS 320 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, message-passing programming, performance models and analysis techniques, domain-specific parallel algorithms.
Prerequisite: CS 320 and CS 333.. Corequisite: CS 415L.

## CS 420 - Object-Oriented Programming and Design (4)

The fundamental concepts ofobject-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. Is sues addressed may include data abstraction and modeling, the use and misuse of inheritance, higher-order data structures and their operations, reusability, refactoring, concurrency control, and usability. Includes programming assignments in an OO language.

Also offered for graduate-level credit as CS 520 and may be taken only once for credit. . Prerequisite: CS 320..

## CS 420P - Object-Oriented Programming (4)

The fundamental concepts ofobject-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 assignments in languages such as Smalltalk, Eiffel and C++ will be given.

Prerequisite: CS 320 ..

## 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 analys is, and lexergenerators; parsing (recursive descent, top-down, and bottom-up), and parser generators; typechecking and static analysis. Design and implementation of a front-end for a small programming language.
Prerequisite: CS 201, CS 202, CS 300, CS 311 and CS 320..

CS 421 L - 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 analys is, and lexer generators; parsing (recursive descent, top-down, and bottom-up), and parser generators; type checking and static analysis. Design and implementation of a front-end for a small programming language.

Prerequisite: CS 201, CS 202, CS 300, CS 311 and CS 320..

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; run-time organization, including functions, objects, and closures; run-time systems. Des ign and implementation of an interpreter and a compiler back-end for a small programming language.
Prerequisite:CS 201, CS 202, CS 300, CS 311 and CS 320..

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; run-time 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 202, CS 300, CS 311 and CS 320..

## CS 430P - Internet, Web, \& Cloud Systems (4)

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 530 and may be taken only once forcredit.. Prerequis ite: Upper-divis ion standing and admis sion into the CS program.

## CS 431 - Introduction to Performance Meas urement, Modeling and Analysis (4)

A survey of the fundamentals of computer application and systemperformance. Hands on programming exercises will allow us to apply the techniques to increasingly complexproblems. 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 forcredit.. Prerequisite: CS 201 and CS 202 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 usingNVIDIA GPUs and Intel Xeon Phi.

Also offered for graduate-level credit as CS 535 and may be taken only once forcredit.. Prerequisite: CS 333..

CS CS 435L- Lab for CS 435 (0)
Lab for CS 435.
Corequisite: CS 435.

## CS 438-Computer Architecture (4)

Processors, memory hierarchy, and bus systems. Multi-level 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 forcredit.. Prerequisite: CS 333..

## CS 441 - Artificial Intelligence (4)

Introduction to the basic concepts and techniques of artificial intelligence. Knowledge representation, problemsolving, machine learning, natural language understanding, and AI search techniques.

Also offered for graduate-level credit as CS 541 and may be taken only once forcredit.. Prerequisite: CS 202..

## CS 442 - Advanced Artificial Intelligence: Combinatorial Games (4)

Covers the theory and practice of finding optimal and satis fying 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. Emphasis on implementation of state-of-the-art solution techniques.

Also offered for graduate-level credit as CS 542 and may be taken only once forcredit. . Prerequisite: CS 202 or experience with algorithms and data structures..

## CS 442P - Advanced Artificial Intelligence: Combinatorial Games (4)

Covers the theory and practice of finding optimal and satis fying 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. Emphasis on implementation ofstate-of-the-art solution techniques.

Prerequisite: CS 202 or experience with algorithms and data structures..

## CS 443 - Advanced Artificial Intelligence: Combinatorial Search (4)

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. Emphas is 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 forcredit. . Prerequisite: CS 202 or experience with algorithms and data structures..

## CS 445-Machine Learning (4)

Provides a broad introduction to techniques for building computer systems that learn from experience; conceptual grounding and practical experience with severallearning 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, complex systemmodeling, and iterative optimization. Students gain practical experience implementing and evaluating systems applied to pattern recognition, prediction, and optimization problems.
Also offered for graduate-level credit as CS 545 and may be taken only once for credit. . Prerequisite: Mth 261 or Mth 343; CS 202..

## 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 forcredit. . 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 ofs imple packages, device independence, and standard packages. Distributed 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 once for credit. . Prerequisite: CS 202, Mth 261..

## CS 447P - Computer Graphics (4)

This course will provide an introduction to graphics systems and applications. Basic structure of interactive graphics systems, characteristics of various hardware devices. Control of display devices, implementation ofs imple packages, device independence, and standard packages. Distributed architectures for graphics, hidden line and hidden
surfaces algorithms, representations of curves and surfaces.

Prerequisite: CS 202, 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 developmenttechniques 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 complex software systems.

Also offered for graduate-level credit as CS 552 and may be taken only once forcredit.. Prerequisite: CS 300, CS 333, CS 350; knowledge ofC++ or Java programming..

## CS 454-Software Engineering (4)

Current methodologies for the development of large, industrial 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 forcredit. . Prerequisite:CS 300 and CS 320 ..

## CS 457 -Functional Programming (4)

Introduction to functional notation, recursion, higherorder 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 once for credit. . Prerequisite: Senior-standing and admission into the CS program.

## CS 461 - Open Source S oftware 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 presentmaterial, working using email and the web.

Also offered for graduate-level credit as CS 561 and may be taken only once forcredit. .Prerequisite: CS 300.

## 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 presentmaterial, working using email and the web.

Prerequisite:CS 300 ..

## 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 upon tool-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 once forcredit. . Prerequisite: CS 300.

## CS 465P - Full-stack WebDevelopment (4)

This class provides an overview of how the web works and covers the spectrumofa full stack web developer, including both front-end and back-end development for delivering both mobile and desktop web applications.
Also offered for graduate-level credit as CS 565 and may be taken only once forcredit. .

## 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 W AP 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 realcustomer. 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 oftwo CS 469, CS 470 and must be taken in sequence. Offered as $\mathrm{P} / \mathrm{NP}$ only.
Prerequisite: CS 300, CS 320, CS 333, CS 350 and at least one Programming intensivecourse..

## CS 470 - Software Engineering Caps tone II (3)

Emphasizes teamwork on a substantial project that will be developed for a realcustomer. The course integrates the knowledge and skills from the 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 $\mathrm{P} / \mathrm{NP}$ only.
Prerequisite: CS 469..

## CS 480 - Randomized Algorithms and Probabilistic Analys is (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, martingales, 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 forcredit. . Prerequisite: CS 350, Stats 451..

## CS 485-Cryptography (4)

The goal of cryptography is the encoding of information via a cryptographic system.
Cryptanalysis studies the breaking ofcryptosystems. 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 forcredit. . 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. Databaseapplication development environments. Overview of physical data
organization, query optimization and processing, physical design, security, and transactions 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 andoperator 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-sourceNoSQL databases. 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 for credit.. Prerequisite: CS 486 or consent of the instructor..

## CS 490 - Introduction to Multimedia Computing and Networking (4)

Introductory course in multimedia computing and networking intended for senior undergraduate or graduate level students. Theobjectiveof 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 for credit.. Prerequisite: CS 333 or instructor's permis sion. .

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, foundationalmodels, and salient examples will be covered. Security in computer operating systems, networks, and data will be covered, with emphasis on operating systemand programsecurity.

Also offered for graduate-level credit as CS 591 and may be taken only once forcredit. . Prerequisite: CS 333, CS 350, C and Java programming..

## CS 492 - Malware Reverse Engineering (4)

Studies thetechniques malicious codedevelopers 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 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 forcredit. . Prerequisite: Junior-standing 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 perform rudimentary 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. Is sues 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. Is sues 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, give students practical experience in how they work, and study how they can be prevented. The class will consistmostly 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 once forcredit.. Prerequisite: CS 201.

## CS 496 - Network Security (4)

Focus on network security including a review of various forms ofnetwork attacks; a review ofbasic techniques in applied cryptography, and secure protocols will be covered including network-layer security and various application-layer 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 -Sens or Networks (4)

Foundations of sensor networks, with a focus on activity-based learning through a sequence of handson programming exercises with embedded devices with a high-level programming language. Bas ic 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 satis fied 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 forcredit. .

## CS 498 - Introduction to Wireless Network

 Protocols (4)Classification of wireles s networking systems; study of multiple acces s protocols in single hop and multihop networks; performance analysis of protocols; overview of emerging radio technologies for highthroughput 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 - Res earch (1-9)

(Credit to be arranged.) Consent of instructor.

CS 502 - Independent Study (1-9)
(Credit to be arranged.)

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 ins tructor.

## CS 505-Reading and Conference (1-12)

(Credit to be arranged.) Consent of ins tructor.

## 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 ins tructor.

## 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, mess age-passing 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 modeltheir 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, 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. . Prerequis ite: 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.. Prerequis ite: Graduate-standing and admis sion 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 exercises will allow us to apply the techniques to increasingly complexproblems. We will use a variety ofs tate of the art tools for meas urement, modeling, simulation, and analysis throughout the course.
Also offered for undergraduate-level credit 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, scheduling, concurrent programming, synchronization mechanisms, memory management, virtual address translation, file systems and security. A primary goal of the course is to help graduate students acquire the foundational knowledge neces sary 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, resource allocation, memory management, file systems, and security. Techniques for implementing operating systems taught through a programming project.

Prerequisite:CS 333..

## 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)

Processors, memory hierarchy, and bus systems. Multi-level caches and cache coherencein 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 undergraduate-level credit as CS 438 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, problemsolving, 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. . Prerequis ite: CS 202..

## 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 also be discussed. Emphasis on implementation of state-of-the-art solution techniques

Also offered for undergraduate-level credit as CS 442 and may be taken only once for credit. . Prerequisite: CS 202 or experience with algorithms and data structures..

## 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. Emphas is 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: CS 202 or experience with algorithms and data structures..

## CS 545-Machine Learning (3)

Provides a broad introduction to techniques for building computer systems that learn from experience; conceptual grounding and practical experience with severallearning 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, complex systemmodeling, 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.. Prerequisite: Mth 261 or Mth 343 and CS 202..

## 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. . Prerequis ite: 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 hardware devices. Control of display devices, implementation ofs imple 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-level credit 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-dimens ional computer graphics. Conic sections in design.
Prerequisite: CS 163 and 451..

## CS 550 - Parallel Algorithms (3)

Definition and nature of parallel computation. Parallel computation from the 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 form of 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 nonlinear equations.

Also offered for undergraduate-credit as CS 451 and may be taken only once forcredit. .

## 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 developmenttechniques 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 complex software systems.
Also offered for undergraduate-level credit as CS 452 and may be taken only once for credit. . Prerequisite: CS 300, CS 333, CS 350; knowledge ofC++ or Java programming..

## CS 553 - Design Patterns (3)

Software design patterns are reusable solutions to recurring software problems. They capture successful experiences 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, industrial strength software systems. Topics include requirements, specification, design, implementation, testing, projectmanagement and cost estimation, formal methods, and software process improvement.
Also offered for undergraduate-level credit as CS 454 and may be taken only once for credit. .

## CS 555 -Software Specification and Verification

 (3)Theoretical and practical aspects of the software development process ors oftware lifecycle. Covers the first part of the cycle: formulating the external requirements, specifying what the software is to do, and the abstract design. Emphas is will be on the formal as pects 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 aspects 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, higherorder functions, reasoning about functions, and models for the evaluation of applicative expres sions. Use of functional languages.
Also offered for undergraduate-level credit as CS 457 and may be taken only once for credit. . Prerequis ite: Graduate-standing and admission into theCS program.

## CS 558 - Programming Languages (3)

In-depth study of current and historical issues in the design, implementation, and application of programming languages. Topics range frombas ic to advanced. Areas include syntax, semantics, scoping, typing, abstraction, exceptions, and concurrency. Computational paradigms such as functional, logic, and/orobject 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 Meas urement 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 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.

Prerequisite: Stat 460, CS $202 .$.

## CS 561 - Open Source Software Development Laboratory (3)

Explores Open Source software engineering and its methodologies in a laboratory classroomsetting. Focuses on thedevelopment 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 undergraduate-level credit as CS 461 and may be taken only once for credit. .

## CS 562 - Advanced Open Source Software Engineering (3)

Surveys the growing academic literature describing tools, techniques, community management, project management and collaboration strateg ies used in open source software development. Emphasis is placed upon tool-driven development, upon open development processes and tools, and upon comparis on 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 565 - Full-s tack WebDevelopment (3)

This class provides an overview of how the web works and covers the spectrumofa full stack web developer, including both front-end and back-end development for delivering both mobile and desktop web applications.

Also offered for undergraduate-level credit as CS 465P and may be taken only once forcredit. .

## 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 WAP architecture, as well as an in-depth exploration of the WAP ApplicationLayer (WAE), including WML, WMLScript, and the WAP push framework.
Also offered for undergraduate-level credit 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 paradigm will be explained in some depth and complemented by encoding practical problems in a functional logic language using a leading compiler/interpreter. Focus on non-determinismand 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 -Scholars hipSkills for Computer Science and Engineering (3)

The purpose of 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 ofmodern scholars in computer science.

Also offered as CS 669 and may be taken only once for credit. . Prerequisite: admis sion into a Ph.D. programwithin 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, devicedriver 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 course on computer systems. Topics include operating systems, performance evaluation, device analysis, 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 Proces sors (3)

An advanced course on compiler construction for modern programming languages, such as objectoriented 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 formalmathematical study of programmeaning (semantics), using one or more approaches such as operational semantics, denotational semantics, or programming logics. Emphas is on rigorous mathematical developmentand formal proof techniques. Language features to be studied may include types and type safety, purity and imperative effects, functional and modular abstraction, polymorphism, higher-order functions, and object-oriented features. Expected preparation: CS 558 and/or CS 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 offunctional correctness of hardware and software systems. Topics to be covered include: formal logics for system verification (first-order logic, higher order logic, temporal logic), formal specifications, theorem proving systems, circuit verification, microprocessor verification, and systemsoftware 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-level credit 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 ofmodels 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 ( $\mathrm{P}, \mathrm{NP}$,

PSPACE, and PH), NP-completeness, relativized computation, randomized classes.

Prerequisite: CS 311, 350..

## CS 583 -Automata and Formal Languages (3)

An advanced study ofthe 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 analys is 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 the encoding of information via a cryptographic system. 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 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. Databaseapplication development environments. Overview of physical data organization, query optimization and processing, physical design, security, and transactions 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 environments, 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 or being developed. The topics range fromnovel data processing paradigms to commercial data management platforms and open-sourceNoSQL databases. 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 ins tructor..

## CS 590 - Introduction to Multimedia Computing and Networking (3)

Introductory course in multimedia computing and networking intended for senior undergraduate or graduate level students. Theobjectiveof this course is to introduce many of the fundamental concepts involved with handling multimedia data and applications. The course will cover (i) bas ic representation and compression of multimed ia 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-level credit 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 emphasis on operating systemand programsecurity.
Also offered for undergraduate-level credit as CS 491 and may be taken only once for credit. . Prerequisite: CS 333, CS 350, C and Java programming..

CS 592 -Malware Reverse Engineering (3)
Studies thetechniques malicious codedevelopers 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 against 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. . Prerequis ite: 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 perform rudimentary 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. Is sues 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 practicalexperience in how they work, and study how they can be prevented. The class will consistmostly 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. We then turn to network-side security management including both passive meas ures like firewall defense schemes including packet filers and bastionhosts, as well as active intrusion detection and response. 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 -Sens or Networks (3)

Foundations of sensor networks, with a focus on activity-based learning through a sequence of handson programming exercises with embedded devices with a high-level programming language. Bas ic 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 satis fied 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-level credit 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 multihop networks; performance analysis of protocols; overview ofemerging radio technologies for highthroughput next generation systems; study of wireless communication protocol standards for cellular systems; case studies of deployed systems.
Also offered for undergraduate-level credit as CS 498 and may be taken only once for credit. . Prerequisite: CS 250 or ECE 271..

## CS 601 - Res earch (1-12)

(Credit to be arranged.) Consent of ins tructor.

## CS 602 - Independent Study (1-12)

(Credit to be arranged.)

## CS 603 - Dissertation (1-12)

(Credit to be arranged.) Consent of ins tructor.

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 ins tructor.

## CS 607 -Seminar (1-4)

(Credit to be arranged.)

## CS 610 -SelectedTopics (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 successful experiences 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 themost 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 aspects 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. Emphas is 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 -Software Implementation and Testing (3)

Theoretical and practical aspects 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 aspects ofsoftware testing.
Also offered as CS 556 and may be taken only once for credit..

## CS 658 -Programming Languages (3)

In-depth study of current andhistorical issues in the design, implementation, and application of programming languages. Topics range frombas ic to advanced. Areas include syntax, semantics, scoping, typing, abstraction, exceptions, and concurrency. Computational paradigms such as functional, logic, and/orobject oriented are analyzed. Several "recent" programming languages used.
Also offered as CS 558 and may be taken only once for credit. .

## CS 659 - Software Meas urement 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 paradigm will be explained in some depth and complemented by encoding practical problems in a functional logic language using a leading compiler/ interpreter. Focus on non-determinismand 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 -Scholars hipSkills for Computer Science

 and Engineering (3)The purpose of 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 ofthe course, students should be familiar with the tasks and activities of modern scholars in computerscience.

Also offered as CS 569 and may be taken only once for credit. . Prerequisite: admission into a Ph.D. programwithin MCECS..

## CS 672 - Operating System Internals (3)

Internals of a specific operating systemincluding structure of the kernel, block buffering cache, file systemstructure and systemcalls, processstructure 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 Proces sors (3)

An advanced course on compiler construction for modern programming languages, such as objectoriented 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 programmeaning (semantics), using one or more approaches such as operational semantics, denotational semantics, or programming logics. Emphas is on rigorous mathematical developmentand formal prooftechniques. Language features to be studied may include types 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 578 and may be taken only once for credit. .

## CS 684 - Algorithm Design and Analys is (3)

An advanced in-depth study in the design and analys is of algorithms. Topics include models of computation, s orting, 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. Network management will include the
design of LAN-based networks, including spanning tree protocols, bridge learning protocols, virtual LANs, and Ethernet switches, and the security of switches and routers. Network management protocols will be covered in-depth including s witch and router management information bases, as well as associated SNMP protocols, and network monitoring tools. The second half of the class will focus on network security. In order to understand the network security problem, the security section will begin with a review of various forms ofnetwork attacks. We then turn to network-side 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 application-layer secure protocols.
Prerequisite: CS 594..

## CS 699-Special Studies (1-6)

Credit to be arranged.

## 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. Willcover 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-divisionstanding..
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 ofdance and choreographic strategies through readings, observations and preparation of solo dance studies. Expected preparation: upper divisionstanding.

## D 352 -Dance Choreography (4)

Exploring compositional devices and craft unique to group choreography. Choreographing and producing a dance in 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 anda 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. Also cultural 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 his tory-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 level technical skills. Maximum: 12 credits. Expected preparation: D 193 I, II, III or previous dance experience.

## D 395 - Dance: Topics (2)

Intermediate Dance techniques 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. Emphasis on execution and application of all basic ballet vocabulary and onalignment and skilldevelopment. 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 isolation technique ofLatin, 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 ofdesign principles, color theory, and typography. Projects address formal concerns of visual communication design, visual 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 notrequire 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.

Prerequis ite: Instructor approval for non-majors..

## Des 120 -Digital Graphics (4)

Digital media is a creative tool for graphic designers. Lectures introducecurrent 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 assist 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 both typography and design principles. Emphas is 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 ofdesign. Students will become embedded with professionals in the graphic des ign community through a series of guest lectures and field trips. This course may be repeated for credit four times.

## Des 140 - Foundations in Motion, UI, and UX (4)

Introduction to working in digitalmedia. Methods, strategies and processes for thinking creatively are investigated through execution in both motion graphics and UI/UX (user interface and userexperience) design. Emphas is 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 from concept, 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 thatstudents 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 emphas is on raster and vector-based illus tration.

Hybrid illustration techniques ofmixing handmade work with digital imagery and photography may also be explored. Bas ic 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 sequence for 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 visualessay. Problemsolving, idea generation, typography, point of view, conceptual thinking and composition are reinforced. Critical readings, group and individual critiques, and written as signments support visual 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 Managementminors.

Prerequisite: Des 224.

## Des 254 - Typography I (4)

First course in a sequence on typography. Builds on the principles introduced in Art 121. Projects focus on typography as medium and message. Typographic history, including the history of letterforms and the construction and use of grids. Design projects range from purely textual to problems that require the successful integration oftypography 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 (seedepartmental website for requirements).

Prerequisite: Des 121 and Des 120..

## Des 290 - His tory of Modern Design (4)

History ofgraphic design fromc. 1800 to the present, focusing on the changes in style within the field, but also on the interconnection between design and other forms of expression. 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 messages in sequence over multiple pages or screens. Industry standards for design, digital pre-press 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); 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 designthinking strategies can be applied to real-world scenarios through collaborative, project-based experimentation, readings offering perspectives on designers and design topics, and critiques ofdesign solutions. Course is open to all students, but Graphic Design majors cannot take this course for cluster credit.
Prerequisite: Upper-division standing..

## 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 310 -Digital Imaging and Illustration II (4)

Studio course in advanced composition using photoillus tration, vector illus tration, and hybrid illustration techniques. Emphas is is placed on a conceptual approach to composition and creative process
exemplified in the content, style, and execution of illus tration 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); OR formal acceptance into the third year by Sophomore Portfolio Review..

## Des 315 - Profess ional 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 assignments support visual design exploration. Des 320: Focus is placed on narrative structures, 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 sequenceof two: 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 assignments support visual design exploration. DES 321: Projects focus on solving complexcommunication design problems, identity design and branding. This is the second course in a sequence of two: 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 courseshould 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 340 - Interaction Design Principles (4)

Studio course dealing in the fundamentals of Interaction Des ign, incorporating the concepts of sound Graphic Des ign principles with User Experience processes. Students will examine a series of interfaces, learn to analyze their effectiveness, and create designs that better serve real human needs. Topics include User Interface design, Systems Thinking, and User Experience research methods.
Prerequisite: Des 121 and Des 120..

## 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 compressed 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 furnisha laptop computer that meets the departmental standards in terms of hardware and software (seedepartmental website for requirements). Open to non-majors who have prerequisites and consent of the ins tructor.

Prerequisite: Des 340; Formal acceptance into the third year by Sophomore Portfolio Review..

## Des 342 - Interactive Media II (4)

Interactive design that expands on principles of information architecture, navigation systems, and visual interface through theexploration of advanced design and development techniques. Advanced Web production work-flow 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. Technicalstandards for cross-browser design, client-side scripting, advanced HTML/CSS and basic frame-based web animation. This course requires thatstudents furnisha laptop computer that meets the departmental standards in terms of hardware and software (seedepartmental website for requirements). Open to non-majors who have prerequisites and consentof the instructor.
Prerequisite: Des 341 and formal acceptance into the third year of the graphic design programby Sophomore Portfolio Review..

## Des 345 - Introduction to Motion Graphics for Designers (4)

Motion graphics for graphic designers. Apply compositional and typographic skills to sequential story-telling, using self-generated graphic and photographic imagery. Emphas is on work flow, storyboards, and clear communication with increas ingly conceptual projects. Introduction to essential After Effects skills.

Prerequisite: Formal acceptance in to 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 neces sary 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 usefultypeface.

Prerequisite: Des 254..

## Des 354 - Typography II (4)

The second course in a sequence on typography. An emphasis is placed on developing strong conceptual solutions for complextypographic 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, editorial design, campaigns, motion, identity, and websites. 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: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, post-production, interviewing, and group decisionmaking 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 hypothetical projects or case studies related to current
business problems, issues, and trends. Emphas is is placed on strategic design and planning, creative process, project management, and studio management. Students demonstrate skills in research, conceptualdevelopment, persuasive writing and communication, negotiation, collaboration, and team dynamics. 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 developmentof graphic design skills with emphas is placedupon conceptual development,research, visual and written mes sages, 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, tes ted, and maintained on web servers. Team-based design and development process is coord inated through project management practices. Emphasis is placed on strategic and tactical design process, industry standards, usability studies, business proposals, design documents, and other professional practices. 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 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 designtrends, 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 341..

## Des 470 - Design Thes is 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 oftwo: Des 470 and Des 471 and must be taken in sequence.

Prerequisite: Des 320, Des 321 and Des 354..

## Des 471 - Design Thes is 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 criticism. This is the second course in a sequence oftwo: 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 consistent and professional written and verbal presentation. Emphasis is placed on profes sional 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)
Introductionto 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 problem solving methods utilizing tools such as MATLAB, Mathcad, andEXCEL. Introduction to structured computer programming methods via MATLAB scripting language. Lecture and recitation.
Prerequisite: Mth 112.

## EAS 101R-Recitation: Engineering Problem Solving (0) <br> Recitation forEAS 101 Engineering Problem Solving. <br> 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 systems. 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 ins tructor.

## 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 orPh 221 (may be taken concurrently with EAS211). (Ph 211 orPh 221 may be taken concurrently with EAS 211)..

## EAS 212 - Strength of Materials (4)

Study of the relationship between strain and stress in deformable bodies; principles of stress analysis for axial force, flexure, torsion, and shear; studies in combined stresses 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. Bas ic particle and rigid body applications.

Prerequisite:(must be passed with grade of " $\mathrm{C}^{\prime \prime}$ 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 diverseteamand individual exploration in real-world applications, to assist in understanding vague problems, examine causes and solutions to complex scenarios. Gives an appreciation of systems thinking and the foundational philosophy of a modem learning organization.

## 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 - Selected Topics (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 design for given reliabilities underconstraints.
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 - Selected Topics (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 underconstraints.

Also offered for undergraduate-level credit as EAS 461 and may be taken only once for credit. .
Prerequisite: senior standing in engineering..

## Ec - Economics

Ec 200 - Contemporary Economic Issues (4)
Introduction to the economic approach to current political and economic issues. Topics will vary dependingupon 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 ofthe choices individuals face as participants in the markets forgoods, services and factors of production like labor; behavior of profit-maximizing firms operating in markets with vary ing degrees of competitive pressure; potential role of government in intervening to influence market outcomes using taxes and subsidies; reasons for international trade and economic inequality.

Ec $\mathbf{2 0 1 H}$ - Honors Principles of Microeconomics (4)

A study of the market system, involving the essentials of demand and supply analysis; competition andmonopoly; 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 es sentials of money and banking; the role of government expenditure and taxation in achieving economic stability, growth, and development; international monetary is sues including exchange rates and the balance of payments.
Prerequisite: Ec 201..

## Ec 202H-Honors 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 is sues including exchange rates and the balance 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 distribution. 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 ofoutput, employment and prices.
Fundamentals of the theory ofbusiness 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 for Ec 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 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 system versus providing health care under the relatively new systems of health care delivery such as health maintenance organizations (HMOs), preferred provider organizations (PPOs), etc. Compares the American health care systemto 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 circums tances of imperfect competition and/or information.

## 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: Consent of instructor..

## Ec 332U- Economics of Environmental Issues (4)

Examines several local, national and global environmental 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 KarlMarx. Based on reading and interpreting primary sources. Considers the legacy of Marx's ideas on the course of history 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 his tory of development, the causes of economic growth, poverty and inequality, population growth, education and health, sustainable 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, international finance, labor and environmental economics, industrial organization and development economics. Mathematical methods utilized include equations, functions, sets, total and partial differentiation, and linear algebra.
Prerequisite: Mth 251, Ec 201, Ec 202. .

## Ec 399 -Special Studies (1-6)

See department for course description. (Credit to be arranged.)

## Ec 401 -Res earch (1-6)

Consent of instructor. See department for course description. (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 issue 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 illustrate practical as pects of the proposed topic. Evaluation on the bas is of written and oral syntheses of academic and practical knowledge. Only in unusual circumstances willmore than 4 credits be granted for cooperative education/internship.

Prerequisite: Ec 201, Ec 202, and consentof instructor. (Credit to be arranged.).

## Ec 405 - Reading and Conference (1-6)

Consent of instructor. See department for course description. (Credit to be arranged.)

## Ec 407-Seminar (1-6)

Consent of instructor. See department for course description. (Credit to be arranged.)

## Ec 409 - Practicum (1-3)

By prior arrangement with thedepartment, economics majors may receive a maximum of 3 credits in their totalundergraduate programfor economics research done in the community in conjunction with guided reading and regular consultations with the practicum instructor. Recommended prerequisites: 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 410U-SelectedTopics (4)

(Credit to be arranged.)

## Ec 402 -Independent Study (1-12)

(Credit to be arranged.)

## Ec 415-Microeconomic Theory with Calculus (4)

Mathematical analysis of consumers, firms and markets. Uncertainty, Game Theory, Partial Equilibrium Analysis, General Equilibrium Analysis and Welfare. Economics majors take eitherEc 311 or Ec 415 . Ec 415 cannot be used as an elective in the economics major.

Prerequisite: Ec 201, and Ec 380 or Mth 251..

## Ec 417 -Women in the Economy (4)

Different economic theoreticalperspectives are presented to account for women's particular economic roles currently and historically. Emphasis on women's responsibility for child rearing and hous ework; 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 Department Seminar, which brings academic and professional economists to campus to present research on a wide variety of topics, us ing 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 perspectives 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 forcredit. .

## Ec 420 -Money and Banking (4)

Functional and empirical definitions ofmoney and interest rates. Characteristics and role ofbank and non-bank financial institutions in determining the level of money and interestrates. History of the Federal Reserve System. Instruments ofmonetary 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 forcredit. . 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 ofmarkets and behavior of firms that trade in them. Internal organization of firms and assessment of efficiency ofmarkets 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 controlor 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 socialservice activities. Methodologies for valuation of nonmarket goods, such as environmental services, also covered.

Also offered for graduate-level credit as Ec 527 and may be taken only once forcredit. . Prerequisite: Ec 201..

## Ec 428-Project Evaluation (4)

Methodology for programevaluation fromneeds as essment 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 forcredit. . Prerequisite: Ec 311, Ec 415 or consent of instructor..

## Ec 430 -Res ource and Environmental Economics (4)

Overview ofdifferent approaches to economic analys is of resources and environment, and fundamental is sues 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 resources, public goods and valuation. Includes an overview of the economic dimension of policies designed to protect and
improve environmentalquality and protect and efficiently manage natural resources.

Also offered for graduate credit as Ec 530 and may be taken only once for credit. . Prerequis ite: Ec 201..

## Ec 431 - Urban Economics (4)

Functions of the urban economy; the market sector and the public sector. Land use, environmental quality, transportation, housing, income distribution, the organization 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: Upperdivision standing.. Cross-Listed as: USP 431 and RE 431.

## Ec 432 -Advanced Environmental Economics (4)

Examination of the economics ofenvironmental degradation, externalities and pollution control. Emphas is is on the theoretical aspects 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 once for credit. . Prerequisite: Ec 311 or Ec 415, and Ec 430 or permission 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 wildlife. Problems achieving sustainability. Regional, national and international case studies used to illus tratekey policy is sues. This is the same courseas 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 environmentalmanagementsystems. 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.. Cross-Listed as: ESM 434.

## Ec 435 -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 federalismand 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 forcredit. .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 alternativetaxes as sources of public revenue with emphasis on theories of incidence and economic effect. Recommended: Ec 201, Ec 202.

Also offered for graduate-levelcredit as Ec 536 and may be taken only once forcredit. .

## 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 forcredit. .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 anduse.

Also offered for graduate-level credit as Ec 538 and may be taken only once forcredit. . Prerequisite: Ec 311 or Ec 415 ..

## Ec 440 - International Trade Theory and Policy (4)

Theories of international trade. Analysis of the normative as pects of trade including the gains from trade and the effect of trade on economic welfare. Examination of international trade policy and issues of economic integration, economic growth, and current trade problems.

Also offered for graduate-level credit as Ec 540 and may be taken only once forcredit. .Prerequisite: Ec 201; Ec 311 or Ec 415 or consentof 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. Historical 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 forcredit. . Prerequisite: Ec 201, Ec 202; Ec 312 orconsent of instructor..

## Ec 442 - The Multinational Enterprise in the World Economy (4)

The study of the multinational (transnational) enterprise as a formof direct foreign investment. Analysis of theories ofdirect investment; the impact of the multinational enterprise on the national and international economy and the relationship of such firms to the concept of the nation-state. 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 emphas is 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 using 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. Recommended: Ec 201.
Also offered for graduate-level credit as Ec 544 and may be taken only once for credit. .

## Ec 445-Comparative Economic Systems (4)

Introduces the evolutionary-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, MedievalFeudalism, the LaissezFaire 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 for credit. .

## Ec 446 -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-institutionalis tchallenges will also be cons idered.
Also offered for graduate-level credit as Ec 546 and may be taken only once forcredit..

## Ec 447 - Economics of Transition (4)

Examines the formation of the Soviet-type economic systemin the 1920s and 30s and its dis semination after World War II to Eastern Europe, China, and other selected countries. Emphas is is placed on the history of ideas and the historical 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. 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 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 these economies with that of other developing countries.
Also offered for graduate-level credit as Ec 548 and may be taken only once forcredit..

## Ec 450 -Economics of Development (4)

Examines problems of post-coloniallegacy: 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 graduate-level credit as Ec 550 and may be taken only once forcredit. . Prerequisite: Ec 201, 202..

## Ec 453 - Theory of Economic Growth (4)

Introduction to the theory of economic growth. This course will emphas ize 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 War of Independence and the seeds of the Civil War. Indus trialization, urbanization, and development of the frontier. Rise of big business and organized 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 forcredit. .

## Ec 457-American Economic History: the 20th Century (4)

Economic impact of U.S. involvement in World War I. Postwar structural changes. Waning of laissezfaire. Causes of the Great Depression. Economic policies of Hoover and Roosevelt administrations. The New Deal reforms. World WarII 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 forcredit. .

## Ec 460 -History of Economic Thought (4)

Selections fromthe economic writings of various thinkers fromantiquity through the Reformation. A survey of the work of the most important economic theorists 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 labormarkets of increasing wage inequality, globalization, declining unionization, and widespread use of new technologies.

Also offered for graduate-level credit as Ec 565 and may be taken only once forcredit. . Prerequisite: Ec 415 or (Ec 311 and Mth 251).

## Ec 469 - Introduction to Econometrics (4)

General survey of empirical techniques usefulfor 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 ofeconomics, public policy, and urban studies. This course will not be counted as credit for economics graduatestudents, but may be taken by graduate students in other programs.

Also offered for graduate-level credit as Ec 569 and may be taken only once forcredit. . Prerequisite: Mth 251, Stat 243 and Stat 244..

## Ec 472 - Time Series Analys is and Forecasts (4)

Time series analysis, emphasizing model identification, estimation, and forecasting. Nonstationary time series analysis includes unit rootand cointegration tests. Techniques ofmoving average, differencing, and autocorrelation adjustment are introduced. Diagnostic checking following themodel evaluation provides the base model for forecasting. Expected preparation: Ec 370. This course assumes background knowledge of linear regression, algebra, probability theory, statistical inference, dis tribution 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 forcredit. . Prerequisite: Ec 469.

## Ec 476 -Implementing Econometrics using Stata and R (4)

Nuts and bolts techniques for implementing econometric analysis using Stata software, theR
statistical package and a short introduction to SAS. Topics include organizing data, nonp arametric smoothing, 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 forcredit.. Prerequisite: Ec 469 or Ec 570 orpermission of the instructor.

## Ec 480-Mathematical Economics (4)

Mathematics for Economists. Application of differential calculus and matrix algebra to economics. Topics include consumer theory, production functions, and applied general equilibrium models.

Also offered for graduate-level credit as Ec 580 and may be taken only once forcredit. . Prerequisite:Ec 311 or Ec 415; Ec 312, and Ec 380 (orequivalently: 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 forcourse 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 into their academic education. Students are expected to provide a brief proposal ofthe 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 illustrate practical aspects of the proposed topic. Evaluation on the bas is of written and oral syntheses of academic and practical knowledge. Only in unusual circumstances 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)

Consentof 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-Selected Topics (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 particular economic 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 issues with particular importance for women's economic situation.

Also offered for undergraduate-level credit 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 enroll in the Economics Department Seminar, which brings academic and professional economists to campus to present research on a wide variety oftopics, 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 selected economic policy is sues.
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. Characteristics and role ofbank and non-bank financial institutions in determining the level of money and interestrates. 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 theemerging field of ecological economics. Roles and practices of the business, government and nonprofit sectors in fostering sustainability.

## Ec 525 -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. Internalorganization of firms and assessmentofefficiency ofmarkets in determining organization.

Also offered for undergraduatecredit as Ec 425 and may be taken only once for credit.

## Ec 526 -Economics of Regulation (4)

Study of government regulation designed to controlor 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.
Also offered for undergraduatecredit 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 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, also covered.

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 assessment through outcome and effectiveness evaluation. Heavy reliance on case studies. Students may participate in ongoing evaluations.

Also offered for undergraduate-level credit as Ec 428 and may be taken only once for credit..

## Ec 530 -Resource and Environmental Economics

 (4)Overview of different approaches to economic analys is of resources and environment, and
fundamental is sues ofeconomy/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 resources, 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 undergraduatecredit as Ec 430 and may be taken only once forcredit. .

## Ec 531 - Urban Economics (4)

Functions of the urban economy; the market sector and the public sector. Land use, environmental quality, transportation, housing, income dis tribution, the organization and financing of urban public services.

Also offered for undergraduatecredit as Ec 431 and may be taken only once for credit..

## Ec 532 -Advanced Environmental Economics (4)

Examination of the economics of environmental degradation, externalities and pollution control. Emphasis is on the theoretical as pects of market failure, policies/regulations to promote efficient outcomes and policy applications.

Also offered for undergraduate-level credit 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 illustratekey policy is sues. This is the same courseas ESM 533 and may be taken only once for credit.

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 thataffect 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.

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 for state economic action. Includes a detailed study of the principles of voting, public budgeting including cost benefit analysis and PPBS, the theory of fiscal federalismand 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 emphasis 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 anduse. 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 thegains from trade 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-level credit 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-level credit 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 formof direct foreign investment. Analysis of theories ofdirect investment; the impact of the multinational enterprise on the national and international economy and the relationship of such firms to the concept of the nation-state.
Also offered for undergraduate-level credit as Ec 442 and may be taken only once for credit. .

Ec 543 -Global Environmental Economics (4)
An examination ofeconomic forces and theories to understand the causes of global environmental problems and evaluate policy options. Primary emphas is 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 for credit.
Also offered for undergraduate-level credit 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 using 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.

Also offered for undergraduate-level credit as Ec 444 and may be taken only once for credit. .

Ec 545-Comparative Economic Systems (4)
Introduces the evolutionary-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, MedievalFeudalism, the LaissezFaire Market Economy, Fas cist 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 World War II to Eastern Europe, China, and other selected countries. Emphasis is placed on the history of ideas and the historical setting which gave rise to the Soviet model. Includes the examination of the internal contradictions of the model, the "unwinding" ofplanned 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 these economies 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-level credit as Ec 450 and may be taken only once for credit. .

Ec 553 - Theory of Economic Growth (4)
Introduction to the theory ofeconomic 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-level credit 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 Warof Independence and the seeds of the Civil War Industrialization, urbanization, and development of the frontier. Rise ofbig business and organized 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-level credit 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 World War I. Postwar structural changes. W aning of lais sezfaire. 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.
Also offered for undergraduate-level credit as Ec 457 and may be taken only once for credit. .

## Ec 560 -History of Economic Thought (4)

Selections fromthe economic writings of various thinkers fromantiquity through the Reformation. A survey of the work of the most importanteconomic 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 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. Also considers current developments in labor markets of increas ing wage inequality, globalization, declining unionization, and widespread use ofnew 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, but may 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 ofmulticolinearity, heteroscedasticity, autocorrelation, and dis tributed lags are discussed. Some familiarity with calculus, matrix algebra, and computer applications are as sumed.
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 Analys is and Forecasts (4)

Time series analysis, emphasizing model identification, estimation, and forecasting. Nonstationary time series analysis includes unit rootand cointegration tests. Techniques ofmoving 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. . Prerequis ite: Ec 570 OR permission of instructor..

## 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. Nonlineareconometric models including Box-Cox variable trans formation, 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 analysis 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 ors tatistics courses including regression analysis.
Also offered for undergraduate-level credit 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.

Prerequis ite: Ec 480/580 or consent of instructor..

## Ec 584 - Applications of Advanced Microeconomic

 Theory (4)Applies theories of consumer and producer behavior to a variety of real world problems. Different subdisciplines of microeconomics will be covered, which may include two or three of the following: information economics, environmental economics, economics of regulation, industrial organization, law and economics, natural resource economics, labor economics, regionaleconomics, urban economics, and the economics of contracting. For each subdiscipline covered, the mostimportant 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 recent developments 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: FinancialEconomics, 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: independentreading on researchable field-related topics; individual development of a research project, i.e., selection of a subject and plan ofstudy; and periodic reporting of individual res earch projects progress. This is the first course in a sequence of two: Ec 596 and Ec 597. Recommended: Ec 595.

## Ec 597 - Res earch Project II (4)

Intended for graduate students to complete the field project requirement. Course activities include: independentreading on researchable field-related topics; individual development of a research project, i.e., selection of a subject and plan ofstudy; 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 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 is sues. 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 equilibriumanalysis, welfare economics, and economics of inflation. Recommended: Ec 576.

## Ec 698 - Ecos ystem Services Valuation: An Integrated Ass essment (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 same course as Mgmt 698; may only be taken once for credit.
Prerequisite: ESR692, Soc 694 and Geog 694 or instructor's permission.. Cross-Lis ted 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 ofC 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 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 orequivalent with a grade of C or better. 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 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 ofC 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 numbersystems, basic logic gates, TTLdevice parameters, Boolean algebra, logic circuit simplification techniques, timing analysis, 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 level on themathematics 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 analys is, design for testtechniques; 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 ins tructor.

## ECE 211 - Introduction to Design Processes (1)

Introduction to design for electrical and computer engineers. Preparation for a teamproject in ECE 212. Discussion ofdesign processes, needs, requirements, functional decomposition, testing 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 integrate electrical 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 sequenceoftwo: 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, resistive circuits, techniques of circuit analysis, operational amplifiers, and energy storage elements. Weekly lab.
Prerequisite: ECE 102 (with a grade ofC or better) and Mth 252.. Corequis ite: 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 responseofcircuits, sinusoidal steady state analysis and the Laplace Trans formforcircuit analys is. Includes transient response and phasor and Laplace analysis. 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 Analys is III (4)

Frequency response andac power. Includes transfer functions, design of analog filters, Bodeplot 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 sinusoidal steady state circuit responses, ac and three-phase power, op-amp circuits, and trans formers; 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 systemproperties, linear time invariant systems, Fourier series, Fourier transforms, and filters. This is the first course in a sequence oftwo: 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 Sys tems 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 ofC 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 splane and frequency domain. Use oftime and frequency systemidentification techniques for developing plant models. Des ign of feedback compensators for steady-state error reduction, disturbance rejection, transient stability, and dynamic response.
Prerequisite: ECE 223 and Mth 256(with a grade of C or better).

## ECE 321 -Electronics I (4)

Introduction to solid stateelectronics, leading to the phys ical properties and characteristics of solid state electronic devices: diodes, bipolar junction transistors and field effect transistors. Analysis and design of
rectifier topologies and biasing circuits. Application of a computer-aided design (CAD) tool, such as SPICE. Weekly Lab.

Prerequisite: ECE 222 (with a grade of C or better).. Corequisite: ECE 321L.

## ECE 321L-Electronics I Lab (0)

Lab for Electronics I.
Corequisite: ECE 321.

## ECE 322 - Electronics II (4)

Ideal and non-ideal OPAMP 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; Computer-aided design. W eekly 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 waveform generators. Introduction to phase-locked loops. Study of digital circuits used in various logic families. Computer-aided design. Weekly Lab.

Prerequis ite: 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 transmis sion lines; review of vector algebraand calculus in various coordinate systems; Maxwell's equations formagnetostatics and electrostatics; weekly lab.
Prerequisite: Mth 254, Mth 256, Ph 223 or 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 integrity and mathematical solution techniques; weekly lab.

Prerequisite: ECE 331 (with a grade ofC 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: digitallogic; arithmetic operations; pipelining; CISC/RISC; memory hierarchy; virtual memory; input/outputtechniques; computer system components. This course may not be used towards degree requirements for an electrical engineering or a computer engineering 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 of C or better)..

## ECE 361-Computer System Organization (4)

Basic concepts of modern computer systems, computer programming, and data structures. Topics include systemorganization, programming and debugging tools, project and software management tools, $\mathrm{C}, \mathrm{C}++$, scripting languages, performance benchmarking, data structures, 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 modernoperating systemdesign. Topics include: introduction to basic operating system concepts, 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 ofC or better)..

## ECE 371 -Microprocessors (4)

Microprocessor ins truction set architecture of a 32-bit microprocessor, structured development of assembly 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 -Microprocess or Interfacing and Embedded Systems (5)

Teaches the hardware and software design of embedded microprocessor systems. Topics include sensor, transducer, and actuator interfacing; microprocessor-based process control; interfacing with display, vis ion, 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.

Prerequis ite: 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 designofhardware and device drivers for a microproces sor system with 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 willalso 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 co-requis ite 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 for credit.

Prerequisite: junior standing or permission of the instructor.. Cross-Listed as: Sci383U.

ECE 399-Special Studies (0-8)
(Credit to be arranged.)

## ECE 401 - Res earch (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 (112)

(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 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 teambased termproject.

Prerequis ite: 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 need ECE 315 and ECE 321 and ECE 361 and ECE 362 and ECE 371 and ECE 372. All courses must be passed with a grade ofC or better..

ECE 412 -Senior Project Development I (4)
Project teams apply structured design methodology from ECE 411 to original projects with assistance 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.

Prerequis ite: 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 theend of the quarter.
Prerequisite: ECE 412.

## ECE 414-Microsystem Integration and Packaging (4)

Introduction to integrated circuit packaging and microelectronics systemintegration; s ignal integrity; electrical, mechanical, and thermal aspects of microsystempackage simulation and design; electronics packaging materials; microsystem reliability and failure mechanisms; current technology developments.

Prerequis ite: senior or graduate standing in ECE. Cross-Listed as: Also offered for graduate-level credit as ECE 514 and may be taken only once for credit. .

## ECE 410 -SelectedTopics (0-6)

(Credit to be arranged.) Consent of instructor.

## 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. Cours e provides students with a sound understanding of existing devices and gives the neces sary 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 once for credit. . Prerequis ite: 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 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 graduate-level credit as ECE 516 and may be taken only once for credit. . Prerequis ite: ECE 415 (with a grade ofC or better)..

## ECE 417-Nanoelectronics (4)

Operational principles and circuit applications of nanoelectronic devices: electron tunneling devices, (Es aki and resonant tunnel diodes, single electron trans is tors, 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. . Prerequis ite: ECE 322 (with a grade ofC or better) and Ph 319..

## ECE 418-Linear Sys tem Analysis I(4)

Advanced concepts of continuous-time signals, systems, and transforms. Signals:periodicity, orthogonality, basis functions; system: linearity, super-position, time-invariance, causality, stability, and convolution integral; transforms: Fourier series and Fourier transform, Hilbert and Hartley transform, Laplace trans form.
Also offered for graduate-level credit as ECE 518 and may be taken only once for credit. . Prerequis ite: ECE 315 (with a grade ofC or better)..

## ECE 419 -Linear System Analysis II (4)

Advanced concepts of discrete-time signals, systems, and transforms. Signals: periodicity, orthogonality, basis functions; system: linearity, super-position, time-invariance, causality, stability, and convolution sum; transforms: Z Trans form, discreteFourier transformand Fast Fourier transform, discrete Hilbert and Hartley transform; State Space description of a system.
Also offered for graduate-level credit as ECE 519 and may be taken only once for credit. . Prerequisite: ECE 418 (with a grade ofC or better)..

## ECE 421 - Analog Integrated Circuit Design I (4)

Modeling ofIC devices: transis tors, capacitors, res is tors. 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 biasing 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 ofC or better)..

## ECE 422 - Analog Integrated Circuit Design II (4)

Analysis and design ofBJT and MOS operational amplifiers, current-feedback amplifiers, wideb and amplifiers and comparators. Frequency response of amplifiers. Feedback techniques, analysis and design. Stability and compensation of amplifiers, high slewrate topologies. No ise in IC circuits. Fully differential circuits, analog multipliers and modulators. CAD tools forcircuit 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 ofC or better)..

## ECE 424 - Engineering Professional Practice (2)

Prepares graduates for careers in electrical and computer engineering. Topics include ethical reasoning and considerations, strateg ies 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 of C 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 ofC 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 for the 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 for credit. . Prerequis ite: ECE 425 (with a grade ofC or better)..

## ECE 428 -VLSI Computer-Aided Design (4)

Introduces basic techniques and algorithms for computer-aided 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 ofVLSI fabrication with emphasis on interconnections. The necessary 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 shall emphasize VLSI design is sues encountered in deep submicron technology. Throughout the course students will be exposed to research methodology and to a set of academic and commercialCAD tools for physical design.

Also offered for graduate-level credit as ECE 528 and may be taken only once for credit. . Prerequis ite: senior or graduates tanding..

## ECE 431 - Microwave Circuit Design I (4)

Passive microwavecomponents. Design of microstrip circuits. Active high frequency devices. Microwave computer aided design.

Also offered for graduate-level credit as ECE 531 and may be taken only once for credit. . Prerequis ite: ECE 332 (with a grade ofC or better).. Corequisite:
ECE 431L.

## ECE 431L-Microwave Circuit Design ILab (0)

Lab for Engineering Electromagnetics I.
Corequisite: ECE 431.

## ECE 432 - Microwave Circuit Design II (4)

Small-signal amplifier design for gain and noise. Non-linear effects and nonlinearcircuit design. Oscillator 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 for credit. . Prerequis ite:

ECE 431 (with a grade ofC 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 realsystems with application to remote sensing, underwater sonar and medical imaging. Pulsed systems and spectroscopy may also be covered in the context ofterahertzsensing. Coursework will involve readings fromcurrent scientific journals and MATLAB dataprocessing.

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 Cor better)..

## ECE 445-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 undertaken using states pace techniques and equivalent circuit modeling. Design is sues concerning semiconductor devices and magnetics design are als o addressed.

Also offered for graduate-level credit as ECE 545 and may be taken only once for credit. . Prerequis ite: ECE 322 (with a grade ofC or better)..

## ECE 446 - Power Electronic Systems Design II (4)

Dynamic analys is of DC-to-DC converters is presented using states pace techniques and the method ofequivalentcircuit modeling of the switching device. Different control techniques such as current programming and sliding modecontrol are introduced. Inverter and input current waveshaping rectifier circuits are also introduced.

Also offered for graduate-level credit as ECE 546 and may be taken only once for credit. . Prerequisite: ECE 445 (with a grade ofC or better)..

## ECE 451 - 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), linearquadratic Gaussian with loop trans fer recovery design procedures.

Also offered for graduate-level credit as ECE 551 and may be taken only once for credit. . Prerequisite:

ECE 317 (with a grade ofC or better), Mth 261 or Mth 343..

## ECE 452 - Control Systems Design II (4)

Dis crete-time control systems, z trans forms, difference equations, pulse transfer function, sampling, data hold, block diagramreduction. Jury stability test. Various approaches to classical control design ofdis crete time controllers. State space analys is and design in discrete-time.
Also offered for graduate-level credit as ECE 552 and may be taken only once for credit. . Prerequis ite: ECE 451 (with a grade ofC or better)..

## ECE 455 - AI: Neural Networks I (4)

Introduces approach for developing computing devices whose design is based on models taken from neurobiology and on notion of "learning." A variety of NN architectures and associated computational algorithms for accomplishing the learning are studied. Experiments with various of the available architectures are performed via a simulation package. Students do a major project on the simulator, or a special programming project.

Also offered for graduate-level credit as ECE 555 and may be taken only once for credit. . Prerequis ite: senior standing in ECE/CMPE or CS, or graduate standing..

## ECE 456 - AI: Neural Networks II (4)

Focuses on applications. Topics in fuzzy set theory, control theory, and pattern recognition are studied and incorporated in considering neural networks. A design project (using NN simulator) in selected application area is doneby each student.
Also offered for graduate-level credit as ECE 556 and may be taken only once for credit. . Prerequis ite: ECE 455 (with a grade ofC or better)..

## ECE 457 - Engineering Data Analysis and Modeling (4)

Introduces statistical learning theory and practical methods of extracting information from data. Covers time-proven methods of statistical hypo thesis testing, linear modeling, univariate smoothing, density estimation, nonlinear modeling, and multivariate optimization.
Also offered for graduate-level credit as ECE 557 and may be taken only once for credit. . Prerequis ite: 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
analog and digital signals, linear modulation and exponential modulation.

Also offered for graduate-level credit as ECE 561 and may be taken only once for credit. . Prerequis ite: ECE 223 (with a grade ofC 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 data systems, and advanced topics.
Also offered for graduate-level credit as ECE 562 and may be taken only once for credit. . Prerequisite: ECE 461 (with a grade ofC 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 andresolution 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 ofC or better)..

## ECE 479 - 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 reasoning and learning. Applications in scheduling, planning, and as signment. Computer architectures for robotics. Integrated robotic systems formanufacturing. 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. . Prerequis ite: ECE 478 (with a grade ofC or better)..

## ECE 481 - ASIC: Modeling and Synthesis (4)

Covers the fundamentals of the ASIC design process. The topics include ASIC design Flow, basic HDL constructs, test benches, modeling combinational and synchronous logic, modeling finite statemachines, multiple clock domain designs, qualitativedesign 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 ofC or better)..

## 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 dissipation, design for low power, voltages caling approaches, power analysis techniques, power optimization techniques, lowpower 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 graduate-level credit as ECE 583 and may be taken only once for credit. . Prerequis ite: ECE 425 (with a grade ofC or better)..

## ECE 485-Microprocess or System Design (4)

Advanced hardware and software design ofdesktop type microcomputer systems. Topics include large project design management and documentation; DRAM system design, cache organization, connections, and coherency; the memory hierarchy and virtual memory; I/O buses such as AGP, PCI-X, and Infiniband; multithreaded operating system considerations; 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-level credit as ECE 585 and may be taken only once for credit. . Prerequisite: ECE 372 (with a grade ofC or better)..
ECE 486 - Computer Architecture (4)
An introduction to the key concepts of computer systemarchitecture and design. Topics include the design and analysis 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. . Prerequis ite: ECE 485 (with a grade ofC or better)..

## ECE 491 - Laser Systems Design I(4)

Laser topics: especially design of laser, fiberoptic, and related optical systems. Formation and propagation ofmodes 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 ofC or better)..

## ECE 492 - Laser Sys tems Design II (4)

Interaction of light with atoms, Maxwell Schrodinger analys is and rateequation approximations. Effects of
gain, dispersion, 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 -SolidS tate 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 transistorstructures 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 - SolidState Electronics II (4)

The solid state electronics course sequence deals with advanced topics in solid state devicephysics and modeling. Following a discussion on semiconductor properties and modeling as a function of doping and temperature, advanced bipolar transistor structures and MOS trans istors 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 Electronics III (4)

The solid state electronics course sequence deals with advanced topics in solid state devicephysics and modeling. Following a discussion on semiconductor properties and modeling as a function of doping and temperature, advanced bipolar transistor structures and MOS trans istors will be treated in detail. Device models aimed at numerical circuit simulators will be discussed. This is the third course in a sequenceof 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 microsystempackage simulation and design; electronics packaging materials; microsystem reliability and failure mechanisms; current technology developments.

Also offered for undergraduate-level credit as ECE 414 and may be taken only once for credit. . 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 neces sary 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: electron tunneling devices, (Es aki and resonant tunnel diodes, single electron trans is tors, nanodot arrays) 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 518 -Linear System Analysis I(4)

Advanced concepts of continuous-time signals, systems, and transforms. Signals:periodicity, orthogonality, basis functions; system: linearity, super-position, time-invariance, causality, stability, and convolution integral; transforms:Fourier series and Fourier transform, Hilbert and Hartley transform, Laplace trans form.

Also offered for undergraduate-level credit as ECE 418 and may be taken only once for credit. .
Prerequisite: ECE 315.

## ECE 519 - Linear System Analysis II (4)

Advanced concepts of discrete-time signals, systems, and transforms. Signals: periodicity, orthogonality, basis functions; system: linearity, super-position, time-invariance, causality, stability, and convolution sum; trans forms: Z Trans form, discreteFourier transformand Fast Fourier transform, discrete Hilbert and Hartley transform; State Space description of a system.

Also offered for undergraduate-level credit as ECE 419 and may be taken only once for credit. .
Prerequis ite: ECE 418/518..

## ECE 521 - Analog Integrated Circuit Design I (4)

Modeling of IC devices: transis tors, capacitors, res is tors. Temperature and device parameter variation effects. Building blocks of analog integrated circuits: current sources and mirrors, gain stages, level shifters, and outputstages. Design ofsupply 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 slewrate topologies. Noise in IC circuits. Fully differential circuits, analog multipliers and modulators. CAD tools forcircuit design and testing.

Also 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-to-voltage converters, phase-locked-loop circuits, IC filters, self-tuning filters, digital-to-analog converters, analog-to-digital converters, CAD tools for circuit design and testing.

Prerequisite: ECE 422/522..

## ECE 524 - Advanced Embedded In Silico and In Materio Computing (4)

Introduces and develops the advanced hardware and software concepts, design methodologies, and programming paradigms ofemerging embedded in silico and in materio computing systems. Topics covered: physics of computation, spatial computing paradigms, self-assembly and self-organization, morphogenetic systems, molecular and nano-scale computing, non-classical computing and nonclassical programming paradigms, amorphous computing.

Also offered as ECE 624 and may be taken only once for credit. . Prerequisite: ECE 371 orpermission 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 designtools for the 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. . Prerequis ite: 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 tradeoffs 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 als o 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 computer-aided 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 necessary 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, floorplanning and routing) of VLSI circuits is studied. We shall emphasize VLSI design issues encountered in deep submicron technology. Throughout the course students will be exposed to research methodology and to a set of academic and commercial CAD tools for physical design.

Also offered for undergraduate-level credit as ECE 428 and may be taken only once for credit. . Prerequisite: senior or graduate $s$ tanding.

## 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) systemdesign approaches and optimization techniques in the presence of process and environmental parameter variations (2) statistical approaches to circuit and systemdesign, (3) physical design (layout) role in performance evaluation of digital systems, and (4) design and architecture outlook for beyondCMOS Switches.

Also offered as ECE 629 and may be taken only once for credit. . Prerequisite: ECE 428/528 or consent of instructor..

## ECE 531 - Microwave CircuitDesign I (4)

Passive microwave components. Design of microstrip circuits. Active high 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 531L.

## ECE 531L-Microwave Circuit Design ILab (0)

Lab for Microwave Circuit Design I.
Corequisite: ECE 531.

## ECE 532-Microwave Circuit Design II (4)

Small-signal amplifier design for gain and noise. Non-linear effects and nonlinearcircuit design. Oscillator des ign. Introduction to MMIC design. Design project is an integral part of this course.

Also 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 vary ing 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: graduate standing..

## ECE 535 - 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 realsystems with application to remote sens ing, underwater sonar and medical imaging. Pulsed systems and spectroscopy may also be covered in the context ofterahertz sensing.

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 for credit. .

## 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 spectralestimation. 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 fromconcept through synthesis and debug using key techniques for optimizing a design. Expected preparation: ECE 351 Hardware Description Languages and Prototyping or equivalent.
Prerequis ite: Graduate standing. Student must be familiar with Verilog HDL or VHDL. Knowledgeof 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 systemstability, unit commitment and pooloperation.

Prerequisite: ECE 448/548, or instructor permis sion..

## ECE 544 -Embedded System Design 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)
Bas ic DC-to-DC switching converter topologies are presented. Operation in various modes is examined. Steady state design is undertaken usingstate 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 of DC-to-DC converters is presentedusing states pace techniques and the method of equivalent circuit modeling of the switching device. Different control techniques such as current programming and sliding modecontrol are introduced. Inverter and input current waveshaping rectifier circuits are also introduced.

Also offered for undergraduate-level credit as ECE 446 and may be taken only once for credit. .
Prerequisite: 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), linearquadratic 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)

Dis crete-time control systems, ztrans forms, difference equations, pulse transfer function, sampling, data hold, block diagramreduction. Jury stability test. Various approaches to classical control design ofdis crete time controllers. State space analys is and design in discrete-time.
Also 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 555-AI: Neural Networks I (4)

Introduces approach for developing computing devices whose design is based on models taken from neurobiology and on notion of "learning." A variety of NN architectures and associated computational algorithms for accomplishing the learning are studied. Experiments with various of the available architectures are performed via a simulation package. Students do a major project on the simulator, or a special programming project.

Also offered for undergraduate-level credit as ECE 455 and may be taken only once for credit. . Prerequisite: senior standing in ECE/CPE or CS, or graduate standing..

## ECE 556 - AI: Neural Networks II (4)

Focuses on applications. Topics in fuzzy set theory, control theory, and pattern recognition are studied and incorporated in considering neural networks. A design project (using NN simulator) in selected application area is doneby each student.
Also offered for undergraduate-level credit as ECE 456 and may be taken only once for credit. . Prerequis ite: ECE 455/555..

## ECE 557 - Engineering Data Analysis and Modeling (4)

Introduces statistical learning theory and practical methods of extracting information fromdata. Covers time-proven methods of statistical hypothesis testing, linear modeling, univariate smoothing, 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 program modern embedded systems. Topics include object oriented and event-based programming, multitasking, advanced sensors, 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 orECE 585. Expected preparation: CS 202 and/orexperience with ObjectOriented 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 solve multi-objective and NP-hard optimization problems from physicalscience, natural science, engineering 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 assertions and formal verification tools. Topics include pre-silicon simulation and formal verification, System Verilog Assertions, and system verification problem solving approaches. Course will emphasize hands on experience writing as sertions and us ing formal verification techniques. Familiarity with computer architecture and hardware description languages is recommended.

Prerequisite: Graduate standing in ECE or permiss ion 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 data systems, 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 567 -Statistical Communications Theory (4)

As an advanced course in communication theory, topics of statistical decision, estimation, and modulation theory are introduced. Statistical aspects of trans mission 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 568 - Introductory Image Processing (4)

Two-dimens ional systems, image perception, image digitization (sampling and quantization), image transforms (Fourier, Cosine, K-Ltrans forms), image enhancement (histogramequalization, filtering, spatialoperation).

Also offered as ECE 668 and may be taken only once for credit. . Prerequisite: ECE 223..

## ECE 569 - Advanced Image Processing (4)

Introduction to randomfields, image representation by stochastic models, image restoration (Wiener and Kalman filtering), image coding and compression predictive and transform coding, vector quantization).
Also offered as ECE 669 and may be taken only once for credit. . Prerequisite: ECE 565/665, ECE 568/668..

## ECE 570-Computer Vision (4)

Image detection and registration, image analysis (texture extraction, edge detection, segmentation), image reconstruction (radontransform, Fourier reconstruction), stereo imaging and motion analysis, pattern recognition (recognition, classification and clustering).

Prerequis ite: ECE 568/668..

## 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 reusable testbenches. Additional topics may include hardware acceleration and transactionbased verification techniques. Course includes homework and significant final project with presentation. Familiarity with Verilog and finite state machines required.

Prerequisite: One of following: ECE 351, ECE 540, ECE 544 or ECE 508: Verilog Workshop, or permission of instructor.

## 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 Decision Diagrams. Design for speed, testability, power consumption, reliability, Reed-Muller forms, 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 programschemata. Partitioned control units. Cellular automata. Realization, minimization, assignment and decomposition ofFSMs. Partition and decomposition theory and programs. Microprogrammed units. Microprogramoptimization. Theory and realization of as ynchronous, self-timed 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 systolic, 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.. Prerequisite: 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 digitalIC test, DC parametric 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 differential equations, solution of eigenvalue problems, Fourier methods, vector space operations, and complexvariable 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: graduate standing..

## ECE 577 - Interactive Computer Graphics (4)

An introduction to the principles of interactive computer graphics including logical devices, physical devices, transformation, viewing and clipping in two and three dimensions.

Prerequis ite: 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 vis ion hardware. Problems in image processing, vision, manipulation, and planning. Machines for image processing and computer vis ion. 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 undergraduate-level credit as ECE 479 and may be taken only once for credit. .
Prerequis ite: ECE 478/578..

## ECE 581 - ASIC: Modeling and Synthesis (4)

Covers the fundamentals of the ASIC design process. The topics include ASIC des ign Flow, basic HDL constructs, test benches, modeling combinational and synchronous logic, modeling finite state machines, multiple clock domain designs, qualitative design is sues, ASICconstructions.

Also offered for undergraduate-level credit as ECE 481 and may be taken only once for credit. .
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, theorem pro ving systems, microproces sor verification, and systemsoftware verifications.
Also offered as ECE 682 and may be taken only once for credit. . Prerequisite: ECE 371, orCS 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 dissipation, design for low power, voltagescaling approaches, power analysis techniques, power optimization techniques, lowpower 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 physicalsystems. Topics covered include sampling theory, sensor/actuator interfacing, real-time and fault-tolerant embedded systemdesign. Basics of wireless sensor networks. Modeling and formal verification techniques.
Prerequisite: Graduate standing..

## ECE 585-Microprocess or SystemDesign (4)

Advanced hardware and software design ofdesktop type microcomputer systems. Topics include large project design management and documentation; DRAM system design, cache organization, connections, and coherency; the memory hierarchy and virtual memory; I/O buses such as AGP, PCI-X, and Infiniband; multithreaded operating system considerations; 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 forthis 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 systemarchitecture and design. Topics include the design and analysis of instruction set architectures, memory systems, and high-performance IO systems; bas ic CPU implementation strategies; basic pipelined CPU implementation; performance analysis; and a survey ofcurrent 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 performancememory 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)Dis cussion of parallel computer architectures and their uses. Key topics include MIMD architectures; as sociative processing; shared-memory and mes sagepassing architectures; dataflow and reduction architectures; special-purpose processors;design and analys is of interconnection networks; and an overview of parallel software is sues. Students will complete the projectstarted 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 andperformance of local computernetworks. Emphas is on performance is sues for common protocols used in local computer 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 class 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; VHDLsyntaxand semantics; behavioral, functional, structural and register-transfer descriptions; combinational circuits; finite state machines; levels of systems imulation; 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 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 rateequation approximations. Effects of gain, dispersion, and saturation in the design of laser amplifiers and oscillators.

Also offered for undergraduate-level credit 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 integralpart ofthis course.

Prerequisite:ECE 571 or permiss ion of instructor..

## ECE 594-Applied Optics (4)

An overview of optics and such principal applications as fiberoptics; chemical, biological, and physical sens ors; optical information processing, acoustooptics; lasers and detectors. This course is the same as Ph 564 ; course may only be taken once for credit. Recommended prerequis ites: 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 System Verilog is required. A design verification project is an integral part of this course.
Prerequisite: ECE 571 orpermission of instructor..

## ECE 596-Optoelectronics II (4)

Nonlinear optics, parametric oscillation, frequency conversion, self-focusing, acousto-optics, Brillouin scattering, Raman scattering, magneto-optics, optooptics.

## 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 des ign specifications and manufacturing processes. Hardware and software tools. Specialemphasis to complex microproces sor based systems, though material applicable to any electronic system.

Prerequisite: Graduate standing in ECE or permission of instructor..

## ECE 598 - Introduction to Quantum Mechanics

 (4)An introduction to the formulation and application of wave mechanics; the Schrodinger equation and its application to time-independent problems (both oneand three-dimensional problems); identical particles; approximation methods including mainly timeindependent perturbations. Brief exploration of the potential applications of quantummechanics to engineering: quantumnano-structures and quantum computers. This course is the same as $\operatorname{Ph} 511$; course may only be taken once forcredit. Recommended prerequisites: Ph 318 or 311, Mth 261.

Cross-Listed as: Ph 511.

## ECE 601 -Research (1-12)

(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 Electronics I (4)

The solid state electronics course sequence deals with advanced topics in solid state devicephysics and modeling. Following a dis cussion on semiconductor properties and modeling as a function of doping and temperature, advanced bipolar transistor structures and MOS trans istors will be treated in detail. Device models aimed at numerical circuit s imulators 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 devicephysics and modeling. Following a dis cussion on semiconductor properties and modeling as a function of doping and temperature, ad vanced bipolar transistor structures and MOS trans istors 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 Electronics 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 and MOS trans istors will be treated in detail. Device
models aimed at numerical circuit simulators will be discussed. This is the third course in a sequenceof three: ECE 611, ECE 612, and ECE 613.

Prerequis ite: ECE 323..
ECE 623 - Analog Integrated Circuit Design III (4)

Integrated-circuit oscillators and timers, frequency-to-voltage converters, phase-locked-loop circuits, IC filters, self-tuning filters, digital-to-analog converters, analog-to-digital 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 Silico and In Materio Computing (4)

Introduces and develops the advanced hardware and software concepts, design methodologies, and programming paradigms ofemerging embedded in silico and in materio computing systems. Topics covered: physics of computation, spatial computing paradigms, self-assembly and self-organization, morphogenetic systems, molecular and nano-scale computing, non-classical computing and nonclass ical programming paradigms, amorphous computing.

Also offered as ECE 524 and may be taken only once for credit. . Prerequisite: ECE 371 orpermission 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 tradeoffs 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 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 systemdesign and circuit and systemdes ign in new emerging technologies. It will cover(1) systemdesign approaches and optimization techniques in the presence of process and environmental parameter variations (2) statistical approaches to circuit and systemdesign, (3) physical design (layout) role in performance evaluation of digital systems, and (4) design and architecture outlook for beyondCMOS 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 vary ing fields, planewaves.

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 medicalultrasound.

Also offered as ECE 534 and may be taken only once for credit. . Prerequisite: graduate standing..

## ECE 635-Electromagnetic Fields and Interactions (4)

Classical description of the electromagnetic field: classical electron theory and plasmas. This course is the same as $\mathrm{Ph} 631, \mathrm{Ph} 632$, Ph 633 ; course may only be taken once forcredit. 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 $\mathrm{Ph} 631, \mathrm{Ph} 632, \mathrm{Ph} 633$; 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 $\mathrm{Ph} 631, \mathrm{Ph} 632$, Ph 633 ; course may only be taken once forcredit. This is thethird 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. Des igned 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 Transmission Operation and Control, (4) Introduces the following topics: state estimation, security analys is, contingency monitoring, optimal power flow, reliability, interchange of 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 cons iderations of stochastic and optimal control. Design methods of computer workstations.

Prerequisite: ECE 452/552..

## ECE 667 -Statis tical Communications Theory (4)

As an advanced course in communication theory, topics of statistical decision, estimation, and modulation theory are introduced. Statistical aspects of transmission 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 668 - Introductory Image Proces sing (4)
Two-dimens ional systems, image perception, image digitization (sampling and quantization), image trans forms (Fourier, Cosine, K-Ltrans forms), image enhancement (histogramequalization, filtering, spatialoperation).

Also offered as ECE 568 and may be taken only once for credit. . Prerequisite: ECE 223..

## ECE 669 - Advanced Image Processing (4)

Introduction to randomfields, image representation by stochastic models, image restoration (Wiener and Kalman filtering), image coding and compression predictive and transformcoding, vector quantization).
Also offered as ECE 569 and may be taken only once for credit. . Prerequisite: ECE 565/665, ECE 568/668..

## ECE 670 - Computer Vision (4)

Image detection and registration, image analysis (texture extraction, edge detection, segmentation), image reconstruction (radon transform, Fourier reconstruction), stereo imaging and motion analysis, pattern recognition(recognition, classification and clustering).

Prerequisite:ECE 568/668..

## ECE 672 - Advanced Logic Synthesis (4)

Boolean and multivalued algebras. Cube calculus and its computer realization. Bas ic operators and algorithms of function minimization. Decomposition and factorization theories. Multilevelminimization. Orthogonal expansions and tree circuits. Cellular logic and its applications to Field Programmable Gate Arrays. Spectraltheory of logic optimization. Ordered Binary and Multiple-Valued Decision Diagrams. Design for speed, testability, power consumption, reliability, Reed-Muller forms, 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 fromregular expressions, nondeterministic automata, Petri Nets and parallel programschemata. Partitioned control units. Cellular automata. Realization, minimization, assignment and decomposition ofFSMs. Partition and decomposition theory and programs. Microprogrammed units. Microprogramoptimization. Theory and realization of as ynchronous, self-timed and self-synchronized circuits. Project continuation.

Also offered as ECE 573 and may be taken only once for credit. . Prerequisite: ECE 572/672..

## ECE 674 -High-level Synthes is andDesign Automation (4)

Comprehensive design automation systems. Problems of system and high-level synthesis. Regis ter-transfer and hardware description languages. Data path design: scheduling and allocation. Design methods
for systolic, pipelined, cellular and dynamic architectures. Systemis sues. System-level silicon compilers. Group project: using high-level tools for des ign of a complete VLSI ASIC chip or FPGA 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 threeparts. The first part reviews integrated circuit technologies and fault modeling. The second introduces digital IC test, DC parametric 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 differential equations, solution of eigenvalue problems, Fourier methods, vector space operations, and complexvariable 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, physical devices, transformation, viewing and clipping in two and three dimensions.

Prerequis ite: ECE 575/675..

## ECE 682 - Formal Verification of Hardware/Software Systems (4)

Objective is to introducethe main formalverification methods of hardware/software systems. Topics to be covered include: formal logics forsystemverification (first-order logic, higher order log ic, temporal logic), formal specifications, theoremproving systems, microprocessor verification, and systemsoftware verifications.

Also offered as ECE 582 and may be taken only once for credit. . Prerequisite: ECE 371, orCS 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 performancememory 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)

Discussion of parallel computer architectures and their uses. Key topics include MIMD architectures; as sociative processing; shared-memory and messagepassing architectures; dataflow and reduction architectures; special-purpose processors; design and analys is 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 thestructure and performance of local computer networks. Emphas is on performance is sues for common protocols used in local computer networks. Specifically, polling networks, rings networks, and random-access networks. Allows the studentto analyze network performance and read the current literature.

## ECE 690 - Digital Design Using Hardware Description Languages (4)

An introductory graduate class 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; VHDLsyntaxand 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 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, optooptics.

## 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 childhood education settings. Expected preparation: Undergraduateearly 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 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 emerg ing identities, es tablishing a classroom culture, and developing problem-solving strategies. Students will draw on social constructivist and critical perspectives in designing equitable clas sroom communities 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: Undergraduateearly childhood education coursework or teaching experience with young children or instructor's approval..

## ECED 425-Culture and Language in Early Childhood Families (3)

Students constructa complexunderstanding of children and families in early childhood settings grounded in diversecultural and political contexts. Students explore the role of theory in providing frameworks for understanding and interpreting child and family development in the early childhood clas sroom, 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 consider how mathematical ideas emerge from children's real-life experiences in cultural settings and how to support math acquisition through play. Reflect on and create activities that are grounded in res earch about children's development in numeracy and other math concepts. Explore how to nurture mathematical understanding through reflection, environmentaldesign, the useofliterature and games, and responsiveness to cultural diversity.

Also offered for graduate-level credit as ECED 526 and may be taken only once for credit.. Prerequisite: Undergraduateearly childhood education coursework or mathematics coursework or teaching experience with young children or ins tructor's approval..

## ECED 427 -Inspirations in Early Childhood 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 coursework
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 classroom environments, pedagogy and curricula that ensure full access for all children and that recognize children's strengths and educational "rights" (notneeds) in order to ensure equity.
Also offered for graduate-level credit as ECED 528 and may be taken only once for credit.. Prerequisite: Undergraduateearly childhood education coursework or teaching experience with young children or instructor's approval.

## ECED 429-Art as Languages of Early Childhood (3)

Consider children's engagement in artistic and representational processes as a means of coconstructing knowledge. Challenge the assumption 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 expres sion 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: Undergraduateearly 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 emotional development. Links are made between theories and brain development research to the activities 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 fromdiverse cultural contexts, and implementing positive guidance strateg ies 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. Prerequis ite: Undergraduateearly childhood education coursework
or teaching experience with young children or instructor's approval..

## ECED 471 - Play: Curriculum in 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 assessment 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-level credit as ECED 571 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 422 - Advanced Curriculum Design in Kindergarten/ Primary Grades (3)

This course will cons ider 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 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 ofdirecting, teamwork, and/or coordinating classroompedagogy and practice. Explore leadership roles in schools for young children including: teachers, supervisors, children, and parents. Collaborative and relational dimens ions 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. . Prerequis ite: 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 dis abilities 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. .Prerequisite: Upper-divis ion standing..

## 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 ofbecoming literate. Expected preparation: Undergraduateearly childhood education 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 476 - Equity and Cultural Diversity in Early Childhood Education (3)

Explore developmental early childhood education practices, emphasizing developmentally and culturally appropriate objectives as well as anti-bias learning goals. Develop awareness of quality teaching practices by exploring personal cultural history, gaining insights into living examples of difference, witnessing the effects of bias, and learning to support fairness and issues of equity in a classroom.

Also offered for graduate-level credit as ECED 576 and may be taken only once for credit..

## ECED 477 -Learning Designs: Early Childhood Environments (3)

Study ofquality learning environments and design, emphasizing the roles of children's learning, adult engagement, and the environment as the third teacher. Investigate space planning, programlayout, design theories, and aesthetic values.

Also offered for graduate-level credit as ECED 577 and may be taken only once for credit. . Prerequis ite: 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 them to construct knowledge. Students have the opportunity to develop res ources and design clas sroomexperiences related to big ideas.

Also offered for graduate-level credit as ECED 578 and may be taken only once for credit. . Prerequis ite: Junior levels 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 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 profes sional development with supervisory 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 Curriculum Design in 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 for credit..

## ECED 523 -Leading in ECE Programs (4)

Develop a strong sense of early childhood leadership identity through multiple lenses ofdirecting, teamwork, and/or coordinating classroompedagogy and practice. Explore leadership roles in schools for young children including: teachers, supervisors, 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 for credit. . Prerequisite: Undergraduate early childhood education coursework orteaching 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, supporting emerg ing identities, es tablis hing a classroom culture, and developing problem-solving strategies. Students will draw on social constructivist and critical perspectives in designing equitable clas sroom communities 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: Undergraduate early 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 from a strength-based perspective, including understanding the relationship between language and culture and bilingual development.

Also offered for undergraduate-level credit as ECED 425 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 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 from children'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 ofliterature 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 ins sirations 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. Engagein in-depth exploration of an issue 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 constructivistperspectives in developing classroom environments, pedagogy and curricula that ensure full access for allchildren and thatrecognize children's strengths and educational "rights" (notneeds) in order to ensure equity.
Also offered for undergraduate-level credit as ECED 428 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 529-Art as Languages of Early Childhood (3)

Consider children's engagement in artistic and representational processes as a means of coconstructing knowledge. Challenge the assumption 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 expres sion 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 the activities thateducators implement every day with toddlers. Topics include observing, establishing nurturing relationships, planning secure environments, designing learning experiences to engage and reflect very young children fromdiverse cultural contexts, and implementing positive guidancestrategies to support emotional well-being and identity development.

Also offered for undergraduate-level credit as ECED 430 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 550 - Foundations in Early Childhood and Inclusive Education (4)

Focus on foundations of and approaches to inclusive early childhoodeducation. Learn about developmental 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: Inclusive Education and Curriculum and Instruction..

## ECED 551 - Child Development in Early Childhood and Inclusive Education (4)

Study a multicultural perspective of child development (i.e., physical, social and emotional, language and literacy, cognitive) for young children (prenatal-preschool) with a range of ability levels. Examine theories ofdevelopment and how those theories apply to young children with differing ability levels.

Prerequisite: Admis sion to the Masters in Early Childhood Education: Inclusive Education and Curriculum and Instruction..

## ECED 553 - Iss ues in Early Childhood and Inclusive Education (4)

Study contemporary is sues related to inclusion in early childhood programs for children of all ability levels. Identify and respond to critical issues in contemporary early childhood education as it relates to inclusion. Analyze those issues froma variety of perspectives.

Prerequisite: Admission to the Masters in Early Childhood Education: Inclusive Education and Curriculum and Instruction..

## 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: Curriculum in 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 assessment 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.. Prerequisite: Undergraduate early childhood education coursework or teaching experience with young children..

## ECED 572 - Language and Literacyin 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 childhood education 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 - Ass essment and Technology in Early Childhood Education (3)

Study of and experience with a range of developmentally appropriate as sessment 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 childhoodeducation settings.
Prerequisite:Undergraduate early childhood education coursework or teaching experience with young children.

## ECED 576 - Equity and Cultural Diversity in Early Childhood Education (3)

Explore developmental early childhood education practices, emphasizing developmentally and culturally appropriate objectives as well as anti-bias learning goals. Develop awareness of quality teaching practice by exploring personal cultural history, gaining insights into living examples of difference, witnessing the effects of bias, and learning to support fairness and issues of equity in a classroom.

Also offered for undergraduate-level credit as ECED 476 and may be taken only once for credit..

## 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 the environment as the third teacher. Investigate space 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 cours ework in child development..

## ECED 578-Constructivist Curriculum: Big Ideas in Early Childhood Education (3)

Examines the possibilities ofexploring 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 them to construct knowledge. Students have the opportunity to develop resources and design class roomexperiences related to big ideas.

Also offered for undergraduate-level credit as ECED 478 and may be taken only once for credit. .
Prerequisite: Prior cours ework 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 designactivities for young children around three questions thatderive 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 cours ework in child development..

## ECED 585 - Dynamic Models of Infant/Toddler Development (3)

Provides information on typical infant and toddler mental health developmentand 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 ( 30 hour) ass igned practicum in public school setting.

Also offered for graduate-level credit as Ed 520 and may be taken only once for 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 Class rooms (2)

Overview ofteaching students who experience dis abilities and giftedness, with special consideration to cultural/linguistic factors. Provides an overview of applicable laws and regulations, eligibility forspecial education, and the IEP process. Explores the ramifications of learning diversity for the inclusive elementary classroomteacher and instruction that supports all learners.

Prerequisite: Admis sion into the Graduate Teacher Education Program.

## Ed 519 - Inclusive Secondary Class rooms (3)

Overview of teaching students who experience dis abilities and giftedness, with special consideration 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 classroomteacher and instruction that supports all learners.
Prerequisite: Admis sion 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 cultural transmis sion and transformation. Includes one credit (30 hour) as signed 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 associated 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: Admis sion 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 classroomand 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 lesson 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 thathave significant implications for learning will be emphasized: cognitive and metacognitive factors, motivational and affective factors, developmental and social factors, and individual differences.

Prerequis ite: Admission 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 inclusiveeducational settings. Provides an overview of language and literacy development for typical and atypical learners. Presents effective instructional practices forteaching and as sessing 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. Emphas is 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 Bas ed As sessment for the Inclusive Educator (2)

This course provides a theoretical framework for using assessment to guide instructionaldecisions. Teacher candidates will learn about formative assessment and data-based 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.
Prerequis ite: 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: Admis sion 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 forum for reflection and discussion of field experience.
Prerequisite: Admis sion to the Inclusive Elementary Educators Program.

Ed 538 - Profes sional Seminar II: Philos ophy (1)
This course provides a forumfor dis cussion and reflection of the field experience, leads to thecreation of a teaching philosophy statement and provides guidance for the completion of the work sample.

Prerequis ite: Admis sion 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 forstudent advising re licensure and graduation.
Prerequisite: Admis sion to the Inclusive Elementary Educators Program.

Ed 540 - Functional Ass essment for the Inclusive Elementary Educator (3)
Develops philosophical and social foundations for services to individuals with significant and multiple disabilities, early childhood through elementary. Emphasizes ecological and functional as sessment strategies for life skills, communication, social, motor, and functional academic domains. Strategies for including students with significantand multiple disabilities in system-wide, standards-based assessment are addressed.

Prerequisite: Admis sion to the Inclusive Elementary Educators Program.

## Ed 541 - Functional Curriculum for the Inclusive Elementary Educator (3)

Course applies knowledge and skills for functional assessment and applied behavior analysis in the design and implementation of an individualized, functional curriculumfor 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 general education classrooms. 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 Elementary Educator (1)

Presents Information and skills necessary for meeting the specialized support needs of students with significant disabilities. Course is designed to assist the educator in becoming an effective memberofa trans-disciplinary teamthat serves students with routine and emergency medical and physical needs and is taught froman inclusive perspective.

Prerequis ite: Admis sion to the Inclusive Elementary Educators Program.

## Ed 580 - Adoles cent Learners in Inclusive Settings (2)

Focuses on principles of human learning and related practices for teaching in inclusive classrooms in the middle/high schoolsetting. 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 Res earcher (2)

Frames research questions concerning the principles, practices, promises, and problems of inclusive class rooms. Explores the philosophical and practical benefits of inclusive practices. Teacher networks, literature reviews and research design will provide
the groundwork for collecting data throughout 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 servicedelivery systems. Explores collaborative teaming processes in middle and secondary school settings.
Prerequisite: admis sion 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. Emphasis on content enhancement tools to increase accessibility 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 studentsupport and advocacy, schoolfamily collaboration and transition planning. Concepts and curriculumrelated to person-centered planning and teaching self-determination skills addressed. Examines collaborativeskills needed to empower students, families, communities, service agencies, and other support systems and facilitate inclusive practices in secondary settings.
Prerequisite: admis sion 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, univers al design for learning, differentiation, and as sistive technology for effectively teaching a diverse group of adolescent learners.
Prerequis ite: admis sion to SDEP program.

## Ed 586-Collaborative Teaching (2)

Students will study practices and techniques that enhance ins tructional collaboration and consultation among general education and special education teaching professionals. Models and methods for supporting students with disabilities in middle and
secondary school general education classrooms will be explored.

Prerequis ite: Admis sion 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 inclusive education. Teacher candidate work samples, compilation and analysis of action research data, and educational leadership project provide culminating experiences blending the dual perspectives ofgeneral and special education and benefits of inclusive practices in teaching content to all students.

Prerequis ite: 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 designed 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 ofspring term to develop and present a formal paper that examines an educational is sue using frameworks and concepts from Ed 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.
Prerequisite: admis sion to doctoral programor permission of instructor..

## Ed 630 - Principles and Practices of Learning (4)

The study of theories oflearning in a variety of educational contexts: clas srooms foryouth and for adults, counseling, and non-school settings. Study of the narratives of teaching and learning to analyze the enactmentof theory and to examine the variety of ways to research learning.

Prerequisite: admission to doctoral programor permission 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: admis sion to doctoral programor permission of instructor..

Ed 650 - Educational Policy and Politics (4)
The study of how policy is proposed, adopted, implemented, and changed in educational organizations. Special emphasis on the political process and how it influences the policy cycle.
Prerequisite: admis sion to doctoral programor permission of instructor..

Ed 660 - Foundations of Research Paradigms and Methods (4)
An introduction to res earch paradigms and research methodolog ies that are useful to better understand and/or address problems of educational practice. Provides doctoral students with knowledge of bas ic 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 analysis 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 ofdata collection and analysis in education. Reviews theoretical foundations, applications and design is sues 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, analysis of variance and chi-square.

Prerequisite: admis sion to doctoral programor permission of instructor..

## Ed 700 - In-service Education (1-6)

(Credit to be arranged.) Credits are for district inservice and are not counted toward a graduate degree or specialist license.

## EE-Electrical Engineering

## EE 347 - Power Systems I(4)

Fundamentals of electrical power systems, particularly non-rotating three-phase power systems. Phas or representation. Complex impedance. Real, reactive, apparent power. Power factor. Nonsinusoidal representation: power quality, THD. Power factor, res onance, PF correction. Power Trans formers. 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-phasemachines. Electromechanical machine components: rotor, stator, poles. Rotating magnetic fields. Fundamental rotational mechanics. Three-phase (induction and synchronous) and split-phase AC motors and generators. DCmachines: 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 orbetter).. 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)

Powersystems modeling. Admittance matrixes.Load flow computational methods; Gauss-Seidel, NewtonRaphson, DC, fast-decoupled power flow. Spars ity techniques. Optimal power flow algorithms.

Symmetrical components, sequence networks. Symmetric, unsymmetric faults. Space vector transformations. Transient operation of transmission lines. Voltage, frequency stability. Stateestimation. Transientstability. Power systemanalysis emphasizing non-dispatchable resources.
Also offered for graduate-level credit as EE 530 and may be taken only once forcredit.. Prerequisite: EE 347 (with a grade ofC 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 comparison 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 ofC or better) or instructor permission.. Corequisite: EE 431L.
EE 431L-Lab for EE 431 (0)
Lab for EE 431.
Corequisite: EE 431.

## EE 432 -Electrical Machine Analysis and Design

 (4)The principals of magnetostatic and quasi-static analys is 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 analysis 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 forcredit.. Prerequisite: EE 348, ECE 317 and ECE 331 (with a grade ofC or better) or instructor permission..

## EE 510-SelectedTopics (0-6)

(Credit to be arranged.)

## 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 no ise floor and dynamic range, and practical implementation of wireless systems with long battery life.
Prerequisite: Graduate standing or permis sion of instructor..

## EE 520 - Random Processes (4)

Review of probability, random variables, and expectation followed by a study ofthe principles and properties of random sequences and random processes. Topics includerandomvectors, fundamentals of estimation, modeling random sequences with linear systems, stationarity, Markov randomsequences, and common randomprocess models.
Prerequisite: Stat 351 and ECE 316, graduate standing orpermis sion of instructor..

## EE 521 - Discrete Time Processing I(4)

Dis crete time signals and systems, $z$-transform, sampling of continuous-time signals, transform analys is of linear time-invariant systems, structures for discrete-time systems.
Prerequisite: EE 520..

## EE 522 -Discrete Time Processing II (4)

Filter des ign, dis crete Fourier transform, faster Fourier trans form, Fourier analysis of signals.
Prerequisite: EE 521..

## EE 523 - Estimation and Detection I (4)

Theoretical and practical approaches to estimation including both classical estimation techniques such as maximum likelihood and best linear unbiased estimation and Bayesian estimation techniques. Discussion of the advantages, limitations, and tradeoffs for each ofthese methods.
Prerequisite: EE 520..

## EE 524 -Estimation and Detection II (4)

Theoretical and practical approaches to detection algorithms. Hypothesis testing, composite hypothesis testing, non-Gaussian noise, model change detection. Many examples with on real-world signal processing applications, including state-of-the-artspeech and communications technology as well as traditional sonar/radar systems.
Prerequisite: EE 523..

## EE 525 -Statistical Signal Processing I: Spectral Estimation (4)

Unified introduction to theory, implementation, and applications ofstatisticalsignal processing methods. Focus on randomsignal modeling, characterization of
stochastic signals and systems, and nonparametric spectral estimation. Designed to give a solid foundation in the underly ing theory balanced with discussion of practical advantages and limitations of nonparametric spectral estimation methods.

## EE 526 -Statistical Signal Processing II: Linear Estimation and 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.

## 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 or equivalent..

## EE 528 -State Space Tracking (4)

Modern approaches to estimating the state of linear and nonlinearsystems. 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 fundamentalunderstanding of the advantages, limitations, and tradeoffs for each of these methods.
Prerequisite:EE 521..

## EE 529-Signal Processing Practicum (4)

Topics include scholarship skills, framing ofsignal processing problems, and algorithm verification. Students design, implement, and verify an engineeringsolution for a signal processing application. This course is intended to be taken after students have completed most oftheir other graduate coursework in signal processing.
Prerequisite: EE 519, EE 522, and permission of instructor.

## EE 530 - Analytical Methods for Power Systems (4)

Power systems modeling. Admittance matrixes. Load flow computational methods; Gauss-Seidel, NewtonRaphson, DC, fast-decoupled power flow. Sparsity techniques. Optimal power flow algorithms.

Symmetrical components, sequence networks. Symmetric, unsymmetric faults. Space vector trans formations. Transient operation of transmission lines. Voltage, frequency stability. Statees timation. Transientstability.Powersystemanalysis emphasizing non-dispatchable 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, perunit calculations \& symmetrical components, phasors, polarity and direction sensing, current/voltage transformers, protection fundamentals \& bas ic 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 EE 431 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 analys is 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 analysis techniques. Electrical machines in wind turbines and in automotive traction motors will be discussed.

Also offered for undergraduate-level credit as EE 432 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, smart-grid systems, transmission and generation components, and cyber security.
Prerequisite: EE 347 or instructor permis sion..

## EE 535 - Power Operations Fundamentals II (4)

Power systemoperations theory and practice; advanced concepts and applications. Emphasis on understanding the electric industry as a complex system; operations concepts for balancing authority utilities; regulatory constraints, interoperability and impacts on operations; projectmanagement of smartgrid systems; design of programmatic, distribution and utility-scale renewable components; utility cyber security.
Prerequisite:EE 534 or instructor permission..

## EE 536 - Power SystemStability (4)

Electromechanical dynamic modeling, analysis, calculations related to transient and steady-state stability within electric power systems. Factors affecting power system transient 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 permission..

## 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 ofhigh-voltage transmis sion lines, power transformers, power generators, high-voltage substation equipment; widearea approach to power systems protection.

Prerequisite: ECE 431 or EE 531 orinstructor permission..

## 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 system control, 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 analysis 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

ELP 199 - Special Studies (1-4)
(Credit to be arranged.)

## ELP 318U- Introduction to Educational Leaders hip 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 class discussions, case studies, guest speakers, and interviews and observations of school leaders at work. Course includes an additional, concurrent 30hour 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 issues through the lens of spirituality.

## ELP 348U- Introduction to Global Political Ecology (4)

In order to grasp theemerging 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 global North and global South, and the relationship of these issues in our personal lives.

## ELP 349U- Gandhi, Zapata and New Agrarianism(4)

This course explores the emergence of "new agrarianis $m$ " 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. Recent philosophical and ecological models of new agrarianismare introduced, with emphasis on local food systems.

## ELP 350 U- Introduction to Leadership for Sus tainability (4)

Multi-media seminar and discussion coursereviews, 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 is sue 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 351U- Gender and Education (4)

Explores the significance of gender in educational work. The focus will be on the history ofgender arrangements in educationalorganizations 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 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, res earch, and practice for the examination of the conditions of being "at-risk" in urban schools. Explores the family, community, and schoolenvironments and their relationships in the hindrance of development of children and youth leading to their "at-risk" status. ELP 556 includes an additional, concurrent 30 hour minimum field project requirement.

## ELP 362U- Introduction to School and Community Relations (4)

Major emphas 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 Sys tems 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 forcredit.. Prerequis ite: Upper-division standing.

## ELP 429 - Principles of Training and Development (3)

Examination of the principles of training and development with emphasis 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 graduate-level credit as ELP 529 and may be taken only once forcredit..

## ELP 430-Course Design andEvaluation (4)

Examination of the field of instructional program design for adult learners within the training and development field, in educational and noneducational organizational settings. Focus on learning to design and manage instructional activities in response to training needs and skills analyses. Students are required to select anduse an appropriate design model, design a preliminary needs assessment, develop programgoals and learning objectives, develop an instructional plan, develop a plan to assess 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 forcredit..

## ELP 431 - Contemporary Iss ues in Training and Development (3)

Building on competencies developed during previous courses in the training and development series, provides a culminating experience to theseries. 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 forcredit.

## ELP 432 - 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 transferof 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 forcredit.. Prerequisite: 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 oftraining and development in achieving individual and organizationalgoals, as well as strategies and resources used in effective personnel development. Students analyze how to: develop, manage and evaluate the training function; identify strategies and resources foreffective training management; and diagnosehow the organization's culture and needs affect the selection and success of training management efforts.

Also offered for graduate-levelcredit 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 clas sroomand 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 neces sary 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 integrated gardenbased curriculum.

Also offered for graduate-level credit as ELP 540 and may be taken only once forcredit. . Prerequisite: Upper-division standing..

## ELP 444 - eLearning Instructional Design (3)

Design of a self-paced eLearning simulation with appropriate instructional 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 forcredit. . Prerequisite: Upper-divis ion standing..

## ELP 445 - Developing eLearning (4)

Examination of development methodologies/processes, principles oftask identification, risk mitigation, technical architecture, creative tools, and project managements trategies
used in developing eLearning. Application of learning theory to the development of Learning. Expected preparation: ELP 429 and ELP 430.

Also offered for graduate-level credit as ELP 545 and may be taken only once for credit. .Prerequisite: Upper-division standing. .

## ELP 446 - Early Childhood Education: <br> Relations hips with Home and Society (3)

Considers the sociology of families and communities in the development of cooperative relationships with programs foryoung children.

Also offered for graduate-level credit as ELP 546 and may be taken only once forcredit. . Prerequisite: Undergraduateearly childhood education coursework or teaching experience with young children. .

## ELP 447 - Administration of Early Childhood Programs (3)

Examines theory and practice informing 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 ofyoung children, and 5) significanceof poverty, race, and gender forsuch programs.
Also offered for graduate-level credit as ELP 547 and may be taken only once forcredit. .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 ofeducation on individuals and society. Problemareas in race, class, and gender are explored in the process ofexamining 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 once forcredit..

## 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 forcredit..

## ELP 453 - History of American Education (4)

The historical development of the American educational 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 forcredit..

## ELP 454 - Philos ophy of Education (4)

Study and comparison of the philosophical bases of educational ideas and of the educational implications of philos ophical thought. 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 forcredit. .

## 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, urbanenvironments. The course is organized around several cultural pluralism perspectives; 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 graduate-level credit as ELP 557 and may be taken only once forcredit..

## 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 resources that can be critical for ensuring classroomsuccess 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 once forcredit..

## ELP 466 - Impact of Language and Culture in the Classroom(3)

Learn the importance of intercultural communication in working with children froma 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 issues 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 forcreditl..

## ELP 467 - ESL/Bilingual Program Design 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 achieve high standards in literacy and other academic areas. Learn how these schools combine their understandings and apply the knowledgeoflocal, 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 graduate-level credit as ELP 567 and may be taken only once forcredit..

## ELP 484 - Strategies for eLearning (3)

Best practices in eLearning and pedagogical issues related to des ign, development, and delivery. Application of research in learning and cognitionto eLearning for design, analysis and problemsolving.

Also offered for graduate-level credit as ELP 584 and may be taken only once forcredit.. Prerequisite: Upper-divis ion 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 oftwo: 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 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 second course in a sequence oftwo: ELP 511 and ELP 512.
Prerequisite: graduatestanding. .

## 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 Meas urement and Ass essment (4)

Minimum competency, norm-referenced, and criterion-referenced tests; classroomstudent assessment; characteristics and levels of meas urement; reliability; validity; interpreting test scores; standardized tests; using performance standards; planning and constructing classroom selection; supply and performance tests; portfolio assessment; 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 knowledge democracy, 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, autoethnography, 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 dominant taken-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 des ign and facilitate an effective teaching experience to apply their understanding.

## ELP 518 - 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 theseconcepts to the designing of sustainable systems. Learners willgain 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, andoutdoor education, as well as explore the intersections of indigenous, ecofeminist, and ecojustice perspectives on sustainability. Drawing upon global examples, the course promotes development of practitioners and scholars with proficiency, solutions-based knowledge, and tools to advance sustainability education in their own life/profes sionalcontexts.

## 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 generalenvironments such as learning organizations. Course includes an additional, concurrent 30 hour minimum field project requirement.
Prerequisite: admis sion 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 30hour minimum field project requirement.

Prerequisite: graduatestanding. 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 ofteaching 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: graduatestanding. 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 assess adult learning. Emphasis is given to applications at the classro omand program levels and to practices that thems elves contribute to adult learning. Course includes an additional, concurrent 30 hourminimum field project requirement.
Prerequisite: graduatestanding. .

## ELP 524 - Spiritual Leadership for 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 issues through a spiritual lens.

## ELP 525-StudentServices in Higher Education (4)

Provides an introduction to theprofessional field of studentaffairs within the context of colleges and universities, including its historical, 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.
Prerequis ite: 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 assessment
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 assessing that intervention.

Prerequisite: graduatestanding. .

## ELP 527 - Legal Issues in Higher Education (4)

Provides a general introduction to the law related to highereducation 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 30 -hour minimum field project requirement.
Prerequisite: graduatestanding. .

## ELP 528 - Leaders hipin Postsecondary Education (4)

Examines emerging conceptualizations and forms of leadership and leadership development in postsecondary education. Ethical and valuebases 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 ofeducational 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 emphasis 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-level credit as ELP 429 and may be taken only once for credit..

## ELP 530 - Course Design andEvaluation (4)

Examination of the field of instructional program design for adult learners within the training and development field, in educational and noneducational organizational settings. Focus on learning
to design and manage instructional activities in response to training needs and skills analyses. Students are required to select anduse an appropriate design model, design a preliminary needs assessment, develop programgoals and learning objectives, develop an instructional plan, develop a plan to assess 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 undergraduate-level credit as ELP 430 and may be taken only once for credit. .

## ELP 531 - Contemporary Iss ues in Training and Development (3)

Building on competencies developed during previous courses in the training and development series, provides a culminating experience to theseries. 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-level credit 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 transferof learning. In addition, various techniques and tools for linking learning outcomes with organizational goals will be addressed.

Also offered for undergraduate-level credit as ELP 432 and may be taken only once for credit. Prerequisite:ELP 429/529..

## ELP 533 - Planning and Budgeting in Postsecondary Education (4)

Provides an introduction to the planning and budgeting processes used in colleges and universities. Major emphas is is placed on key concepts, planning models, and applications to institutional 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 oftraining 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 evaluate the training function; identify strategies and resources for effective training management; and diagnosehow the organization'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 formanagers 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 developmentand systems theory in the development strategies for organization 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. Curriculumdevelopment 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 is sues, including life-long and collaborative learning. A comprehensive program planning model will be examined.

Prerequisite: graduate standing. .

## ELP 537 - Policy and Governance in Pos ts econdary Education (4)

An examination of theory and research that relates to how policy is formulated and implemented in postsecondary environments. Thecourse focuses on the policy and governance role of faculty, administrators, and trustees at the single college or
univers ity 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 providestudents with an introduction to the study of postsecondary education using as the vehicle a focus on some of the more pressing is sues currently facing postsecondary education. Thecourse is designed to increase the capacity for the identification and analyses of is sues and the development of positions relative to the is sue.
Prerequisite: graduatestanding. .

## ELP 539 - 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 fortraining materials.
Also offered for undergraduate-level credit 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 assessment. As a learning community, students examine how policies and educational practices can pose barriers or potential leverage points fors systemic change, and develop and teach integrated gardenbased curriculum.
Also offered for undergraduate-level credit as ELP 440 and may be taken only once for credit..

## 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; careereducation; 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, philos ophy, students, staff, services, and patterns of organization of the public community college.

## ELP 542 - Introduction to Service-Learning: Theoretical \& Pedagogical Perspectives in Posts econdary Education (4)

Fundamental principles and practices of servicelearning in postsecondary education. Service-learning pedagogy, its relationship to adult development, historical foundations in educational institutions, and civic education. Resources and organizations, and is sues of race, class, gender, and power in servicelearning. 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, 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 concerns 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 ofcivic engagement, social justice, and socialchange.

## ELP 544 - eLearning Instructional Design (3)

Design of a self-paced eLearning 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 oftask identification, 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-level credit as ELP 445 and may be taken only once for credit.

## ELP 546 - Early Childhood Education: <br> Relationships with Home and Society (3)

Considers the sociology of families and communities in the development of cooperative relationships with programs foryoung children.
Also offered for undergraduate-level credit as ELP 446 and may be taken only once for credit. . Prerequisite:Undergraduate early childhood education coursework orteaching 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) significanceof poverty, race, and gender for such programs.

Also offered for undergraduate-level credit as ELP 447 and may be taken only once for credit. . Prerequisite:child and family studies majoror 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 non-human communities; the relationship between poverty and environmental degradation; the distribution 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 Leaders hip \& Policy Intl (4)

Service-learning in postsecondary educational institutions, their leadership, and policy. Role, organization, and policy of service-learning in different postsecondary institutions, fromcommunity colleges through graduates chools, and the varying ways in which service-learning is structured, researched, and assessed. Practical and theoretical concerns in an applied service-learning experience abroad. Challenges and opportunities of international service-learning. 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 Sus tainability (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 ofeco-spiritual values and Traditional Ecological Knowledge (TEK) in sustainability 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 ofeducation 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 - His tory of Education (3)

A general review of the growth and development of education in relation to the civilization of the times; emphasis is placed upon the development of educational theories at various points in history.
Also offered for undergraduate-level credit as ELP 452 and may be taken only once for credit..

## ELP 553 - History of American Education (4)

The historical 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 - Philos ophy of Education (4)

Study and comparison of the philosophical bases of educational ideas and of the educational implications of philos ophical 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 Pluralism and 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 pluralism perspectives; 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 undergraduate-level credit 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: graduatestanding. .

## ELP 559 - The Principalship (4)

Designed to develop complementary theoretical and practicalunderstanding 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 curriculumchange; analysis of concretesupervisory problems.

## ELP 561 - Staff Development: Planning, Implementation, and Evaluation (4)

Staff development goals; characteristics ofstaff development programs; establishing a staff development organization; policy and decisionmaking; identify ing and responding to the concerns of participants; assessing needs; planning and implementation of specific programs; networking; formal and informal methods ofevaluation; models for staff 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. Majoremphasis 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: graduatestanding. .

## ELP 563 - Human Relations in Educational Organizations (4)

Issues and perspectives in group processes; models for studying groups; principles of group dynamics; human relations with in educational organizations; strategies for group problem-solving and conflict management; application of group dynamics to leadership, communication, and decision-making within educational organizations; 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) decis ion making about the choice of content; 2) politics of curriculum development; 3) implementation and monitoring of curriculumat building site; 4) testing and alignment of curriculum; and 5) evaluation of curriculumimplementation.

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 resources that can be critical for ensuring classroomsuccess 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 froma wide range of cultures in today's classroom. Survey the cultural, linguistic, educational, and ethical is sues present in all classrooms today. Study the sociological and language issues and immigration history. Learn how to identify and appreciatecultural 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 Program Design 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 achieve high standards in literacy and other academic areas. Learn how these schools combine their understandings and apply the knowledgeoflocal, 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-level credit 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 adminis trative 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 organizations. Course includes an additional, concurrent 30 hour minimum field project requirement.

Prerequisite: graduate standing. .

## ELP 569 - Introduction to Educational Administration (4)

Introductory course required of applicants to the Initial Administrator certificate program. Cons iders educational, social, political, economic, organizational, and cultural forces shaping U.S. public schools and their administration. Course includes an additional, concurrent 30 hour minimum field project requirement.

## ELP 570 - Human Relations and Educational Foundations (4)

Explores the historical, social, philos ophical, and organizational foundations of public education. Examines the dynamics of human relationships, leadership, and community building in schools and educational settings. Analyzes public education goals and decision-making processes for achieving these goals.

Prerequisite: admis sion to initial administrator program.

## ELP 571 - Teaching, Learning, and Curriculum (4)

Examines the complex relationships between staff evaluation, individual professional development, staff development, and effective teaching, learning, and curriculum. Students will examine those factors which make supervision and evaluation really work, i.e., contribute to the largerpurpose of building an environment where teachers can deliver their best and children can learn most.

## ELP 572 - Human Res ource Development and Organizational Change (4)

Examines how the relationships between people and organizational structures, policies, and processes influence school culture and change efforts. Studies how school leaders secure and manage res ources to improve teaching and learning for all within the school community.

## ELP 573 - Educational Leadership Project I (1)

Focus on the development, in a school or agency setting, of an Educational Leadership Project demonstrating knowledge, skills, and dis positions required by the TSPCInitial Administrator License Standards. The first quarter of a three quarter project designed in conjunction with a practicumsupervisor to address a leadership challenge area in teaching and learning for student success within an assigned practicumsetting. Students will define the challenge area, research the problemcontext and related literature, and develop an action plan.
Prerequisite: admis sion to Initial Administrator Licensure Program. .

## ELP 574 - Education LeadershipProject II (1)

Focus on the implementation, in a school or agency setting, of an Educational Leadership Project demonstrating knowledge, skills, and dispositions required by the TSPC Initial Administrator License Standards. The second quarter of a three quarter project designed in conjunction with a practicum supervis or to address a leadership challenge area in teaching and learning for student success within an as signed practicums etting. Students will implement their action plan by collecting, organizing, and analyzing data.
Prerequisite: admis sion to the Initial Adminis trator Licensure Program.

## ELP 575 - Educational Leadership Project III (1)

Focus on final analysis of an Educational Leadership Project demonstrating knowledge, skills, and dispositions required by the TSPC Initial
Administrator License Standards. The third quarter of a three quarter project designed in conjunction with a practicumsupervis or to address a leadership challenge area in teaching and learning for student success within an assigned practicumsetting. Students will analyze the outcome of their year-long project, suggest implications for further research, and reflect on the entire project.

Prerequisite: admis sion to the Initial Adminis trator Licensure Program.
ELP 576 - Education, Community, and Society (4)
A review of sociological theories and research that illuminates the social and economic functions of education in modern society, with special emphasis placed on application of the role of the practicing school administrator as instructional leader and manager. Race, clas s, gender, and differing ability levels are explored in the process of examining theories of socialization, certification, allocation, and legitimation and their application to his torical and current educational situations, particularly in schools and school districts. 30-hours of field-based experiences are used to connect the theories and research covered in class to the practice ofschooling and the work of a school adminis trator.
Prerequisite: admis sion to continuing
adminis trator/initial superintendent licensure program or permission of instructor. .

## ELP 577 - District andS chool Staff Supervision and Evaluation (4)

Advanced course in alternative approaches to district and school staff supervision and evaluation in an era of school reform, heightened accountability, and emerging state and national standards. Topics to be covered are dealing with the at-risk and incompetent staff and new directions in teacher evaluation. 30hours of field-based experiences are used to connect the theories and research covered in class to the practice of schooling and the work of a school adminis trator.

Prerequisite: admis sion to continuing
adminis trator/initial superintendent licensure program or permission of instructor. .

## ELP 578 - Communication and Conflict Management in Educational Organizations (4)

Issues of communication within educational organizations and between educationalorganizations and various audiences. Definitions of conflict and models for peaceful resolution/management of
conflict within educational organizations and with various other individuals and organizations. Attention to world view, cultural styles, positions, underlying needs, bargaining, reforming, and finding common ground. Strategies for group problem-solving, conflict management including collective bargaining and contract management, and community-building. 30 hours of field-based experiences are used to connect the theories and research covered in class to the practice of schooling and the work of a school administrator.
Prerequisite: admis sion to continuing administrator/initialsuperintendent programor permission of instructor. .

## ELP 579 - Curriculum, Instruction, and Assessment Leadership (4)

An examination of standards-based reform, curriculum and instructional models, assessment models, school improvement strategies, and educational changetheories. Emphasis is givento understanding how assessment information can be used to improve student learning and overall school performance within the context of Oregon's state reform framework. 30 hours of field-based experiences are used to connectthe theories and research covered in class to the practice ofs chooling and the work of a school adminis trator.

Prerequisite:admis sion to continuing administrator/initial superintendent programor permission of instructor. .

## ELP 580 - District Policy, Operations, Facilities, and Finance (4)

The role of the district superintendent and local school boards in planning, management, evaluation, and improvement of policies and programs related to school operations, personnel, facilities, and finance to meet school district needs. Examines state and federal laws, regulations, and the roles of ODE and the leg is lature in governing Oregon school finance, school budgeting, and school facilities. 30 hours of field-based experiences are used to connect the theories and research covered in class to the practice of schooling and the work of a school admin is trator.
Prerequisite:admis sion to continuing administrator/initial superintendentlicensure program or permission of instructor.

## ELP 581 - U.S. and Oregon School Law and Policy (4)

Examines federal and Oregon school law governing educational practice and policy at theschool and district levels; the relationships among these factors and their implications for effective communication with educational stakeholders, instruction and student
learning, and effective organizational management of schools. 30 hours offield-based experiences are used to connect the theories and research covered in class to the practice of schooling and the work of a school administrator.
Prerequisite:admis sion to continuing administrator/initialsuperintendentlicensure program or permission of instructor.

## 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 largerpurpose ofbuilding an environment where teachers can deliver their best and children can learn the most.

Prerequisite: admis sion 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 with in an educational setting through problem-based learning.
Prerequisite: admis sion to Initial Adminis trator Licensure Program.

## ELP 584 - Strategies for eLearning (3)

Best practices in eLearning and pedagogical issues related to design, development, and delivery. Application of research in learning and cognition to eLearning for design, analysis and problemsolving.

Also offered for undergraduate-level credit as ELP 484 and may be taken only once for credit..

## ELP 594-School Law (4)

Critical analys is of the legal framework governing schoollaw in the United States, with emphasis on contemporary legal problems of education.
Implications of landmark and current court decisions.
Prerequisite:graduatestanding.

## ELP 601 - Research (1-9)

(Credit to be arranged.)

ELP 602 - Independent Study (1-9)
(Credit to be arranged.)

## ELP 603 - Dissertation (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 knowledge democracy, and give ownership to those whose knowledge it is . Methodologies covered are: different genres of qualitative methods, community-basedplanning and research, participatory action-research, Gaian participatory science, classical ethnography, autoethnography, ethnographic performance, life histories, 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 Pos tsecondary Educational Leaders hip \& Policy Intl (4)

Service-learning in postsecondary educational institutions, their leadership, and policy. Role, organization, and policy of service-learning in different postsecondary institutions, fromcommunity colleges through graduateschools, and the varying ways in which service-learning is structured, researched, and assessed. Practical and theoretical concerns in an applied service-learning experience abroad. Challenges and opportunities of international service-learning. 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 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 as pects of education, the intellectual currents that have supported it, and the social constructs that maintain it. Cultural, historical, social, philosophical, and critical and feminist perspectives as well as modernist viewpoints are included. Participants will read in-depth and write analytical response papers as a grounding for discussion in the seminar and will produce an end of termproject 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 res earch and theory
development in the field of educational administration. Participants will read in-depth and write analytical response papers as a basis for discussion 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 <br> EMCR 520 - Anatomy and History of Disasters (4)

This is survey ofmajor natural dis asters (both geological and weather related ones) that affect humans, focusing on causes, effects, recovery,
planning and prediction. Many case his tories 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 disaster planning. Introduces practicaltools for analyzing community vulnerabilities and actions to take to improve resilience.

Cross-Listed as: This is the same course and PA 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, th is 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.

Prerequis ite: Graduate standing. Cross-Listed as: This is the same course as Comm 545 and may be taken only once forcredit..

## EMCR 550 - International Perspectives on Dis aster 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 can have 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.

## EMCR 560 - Climate Resiliency Planning (3)

Aims to examine the response of society to a changing climate, with an emphasis 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 fromplanning, sociology, engineering, environmental studies, and dis aster 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 Socio-Ecological Sys tems (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 thequestions 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 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-Listedas: This is the same course as PA 587 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 natural events, and sudden and slow-moving catastrophes.It cons iders 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 also explores the roles of perceived risk, connectivity, and social memory. It concludes with an analys is on the successes and failures of humanitarian aid.

Cross-Listedas: 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 team learning 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 organization that requests assistance in preparing a disaster response plan. Teams will make presentations of their plans at the end of the term.
Prerequis ite: 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 forstudents with no previous college-level coursework in literature.

## Eng 104 - Introduction to Fiction (4)

Reading and analysis ofsignificant works of fiction.

## Eng 105 - Introduction to Drama (4)

Reading and analysis ofs ignificant works ofdrama.

## Eng 106 - Introduction to Poetry (4)

Reading and analysis of significant poems.

## Eng 107-Introduction to World Literature (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 ofShakespeare's plays and poetry, with particularemphasis 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 fromthe seventeenth century to the contemporary period.

Eng 253 -Survey of American Literature I (4)
An introduction to American literature fromits beginnings to themid-nineteenth century.

Eng 254 - Survey of American Literature II (4)
An introduction to American literature from the midnineteenth century to the present.

Eng 260 - Introduction to Women's Literature (4)
Study of literature written by and about women across his torical 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 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. Coursemay be repeated for credit with different topics. Up to 8 credits of this course number can beapplied 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, sociologicalcriticism, and psychoanalysis, with discussion of cinema as art form and cultural commodity.

## Eng 305U- Topics in Film (4)

Study offilm 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 ofliterary forms in popular culture, including such topics as fantasy, the graphic novel, and detective fiction. 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 307U-Science Fiction (4)

Study ofscience 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 issues such as colonialism, sovereignty, stereotyping, and cultural authenticity.

## Eng 310U- Topics in Children's and Young Adult Literature (4)

Study ofliterary works written for young audiences, with attention to constructions of childhood and family in changing cultural contexts. Topics vary by genre, historical period, geographical region, author, theoretical approach, or theme. 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 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 thecharacteristics 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 Short Story (4)

A survey of the short story as it developed from the tale, the legend, and the anecdote to its modern form. Although fiction frommany 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 playwrights 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 ChristianNew Testament as literary anthologies of the ancient Near East, emphasizing cultural and historical contexts, political and theological histories, 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 fromthe nineteenth century to the present.

## Eng 325U- Postcolonial Literature (4)

Introduction to key texts, themes, is sues, 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, Imperialis m, 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 aesthetics to the political and institutional contexts of imperialismand globalization.

## Eng 330U- Jewish and Is raeli Literature (4)

Introduction to modern Jewish literature in its diasporic and national contexts. Emphasis on the transition fromsacred to secular literature; reflection of his torical and social realities; development of literatures in Europe and the Middle East.

## Eng 331 U- Introduction to Rhetoric and Composition (4)

Survey of the discipline of rhetoric and composition, including his tory, theory, practice, and teaching.

## Eng 332U- History of Cinema and Narrative Media I (4)

Surveys the history of cinema and narrative media from the late nineteenth-century moving image to the Second World War.

## Eng 333U- History of Cinema and Narrative

 Media II (4)Surveys the history of cinema and narrative media from the end of the Second World War to the 1970s.

Issues 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 beapplied to the English major.
Cross-Listedas:NAS 335U.
Eng 340U- Medieval Literature (4)
Study of medieval literature, including literary genres and themes, historical and cultural contexts, and major authors and movements.

## Eng 341U- Renaiss ance Literature (4)

Study of sixteenth- and seventeenth-century literature, including literary genres and themes, his torical and cultural contexts, and major authors and movements.

## Eng 342U- Fighteenth Century Literature (4)

Study of eighteenth-century literature, including literary genres and themes, historical and cultural contexts, and major authors and movements.

## Eng 343U-Romanticism(4)

Study of Romantic literature, including literary genres and themes, his torical 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 ofmodern British literature, including literary genres and themes, his torical and cultural contexts, and major authors and movements.

## Eng 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 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 353 U- African American Literature III (4)
An introduction to African American literature of the post-civilrights 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 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.

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 anthropocentrismand ecocentrism, 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, his toricaland 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 forcredit with different topics. Up to 8 credits of this course number can be applied to the English major. 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 forcredit 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 from the 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 emphas is 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 WLL 380 and may be taken only once for credit..

## Eng 381 - Topics in Translation Studies (4)

Students will develop analytical 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 from Translation Studies enrich the study of literary and non-literary texts alike. Those with second-language competency can optionally develop skills to produce translations 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 WLL 381.

## 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 artistic responses. Readings and discussions are in English. Course may be repeated for up to 8 credits. Up to 8 credits of this course number can beapplied to the English major.

Cross-Listed as: This is the same course as WLL 383U..

## Eng 385U- Contemporary Literature (4)

Study of contemporary prose, poetry, drama, and/or texts of other genres andmedia, focusing on the formal devices, intellectual undercurrents, and cultural implications of texts froma 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 networked 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 necessary.

## 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)

Consent of instructor. See department for course description. (Credit to be arranged.)

## Eng 407-Seminar (1-6)

Consent of ins tructor. 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 complexmix of performance, spectatorship, cultural context, and theater history. Topics may be drawn froma range of historical periods, frommedieval drama to the present day.

Also offered for graduate-level credit as ENG 511 and may be taken only once for credit.. Prerequisite: Eng 300 and Wr301. (Wr 301 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 feedback.

Also offered for graduate-level credit as Eng 513 and may be taken only once for credit. . 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 develop and pursue research projects according to their interests.
Also offered for graduate-level credit as Eng 514 and may be taken only once for credit. . Prerequisite: Eng 300 and Wr301. (Wr301 may be taken concurrently.).

## Eng 415 - 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 res earch projects according to their interests.
Also offered for graduate-level credit as Eng 515 and may be taken only once forcredit. . Prerequisite: Eng 300 and Wr301. (Wr301 may be taken concurrently.).

## Eng 416-History of Rhetoric (4)

Survey of rhetorical theory and practice from classical 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 for credit. . 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 forcredit.. Prerequisite: Eng 300 and Wr301. (Wr301 may be taken concurrently.).

## Eng 422 - African Fiction (4)

Study of literary and cultural production from the 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 graduate-level credit as ENG 522 and may be taken only once for credit.. Prerequisite: Eng 300 and Wr301. (Wr 301 may be taken concurrently.).

## Eng 426 - Advanced Topics in Medieval Literature (4)

Study of Medieval English 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 es tablished, contested, and creatively appropriated. Investigates 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 fromdominant 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 his tory 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, criticism, ortheory 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 ofthis course number can beapplied to the English major.

Also offered for graduate-level credit as Eng 535.. Prerequisite: Eng 300 or Eng 304 and Wr 301. (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 Humanismand the Reformation, literary traditions, and historical and political contexts. 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 541.. Prerequisite: Eng 300 and Wr301. (Wr 301 may be taken concurrently.).

## Eng 442 - Women Writers in Global Contexts (4)

Study of the works of women writers fromthe 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 for credit..

## 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 criticismand scholarship. This is the same course as WS 444.
Also offered for graduate-level credit as Eng 544 and may be taken only once forcredit.. 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 characteris tic 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. (Wr 301 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 Wr301. (Wr 301 may be taken concurrently.).

## Eng 448 - Advanced Topics: Major Figures in Literature (4)

Study of the works ofone 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 canbe applied to the English major.
Also offered for graduate-level credit as Eng 548.. Prerequisite: Eng 300 and Wr301. (Wr 301 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 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 graduate-level credit as Eng 549.. Prerequisite: Eng 300 and Wr301. (Wr 301 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 major developments (the Enlightenment, the novel, gender and literature, abolitionism, or the culture of sympathy); genres, modes, or forms; or the relation of writing to historical events (slavery, revolution, colonialism, capitalism). Course may be repeated for credit with different topics. Up to 8 credits of this course number can beapplied to the English 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 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 for credit with different topics. Up to 8 credits of this course number can beapplied to the English major.

Also offered for graduate-level credit as Eng 558.. Prerequisite: Eng 300 and Wr301. (Wr 301 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 number can be applied to the English major.

Also offered for graduate-level credit as Eng 560.. Prerequisite: Eng 300 and Wr301. (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 $m$, realis $m$ ); individual authors; genres, modes, or forms; or writing's relation to historical events (such as slavery and abolition, theCivil W ar, American imperialism, industrialization, the women's rights movement). 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 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); individualauthors; genres, modes, or forms; or writing's relation to his torical 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 numbercan be applied to the English major.

Also offered for graduate-level credit as Eng 564.. Prerequisite: Eng 300 and Wr301. (Wr301 may be taken concurrently.).

## Eng 467 - Advanced Topics in American Literature and Culture (4)

Study ofselected 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 ofthis course number can beapplied 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: As ian American and Pacific Is lander Studies; comparative and critical ethnic studies; ecocriticis $m$ and sustainability; immigration and settler colonialism. 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 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. 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 575.. Prerequisite: Eng 300 and Wr301. (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 Wr 301. (Wr 301 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. (Wr301 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. (Wr301 may be taken concurrently.).

## Eng 491 - History of Literary Criticism and Theory I (4)

Historical survey ofsignificant works in the Western critical and philos ophical tradition from ancient Greece to the nineteenth century, with a focus on fundamental questions about literary composition, aes thetic 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 Criticism and Theory II (4)

Historical survey ofsignificant works in the Western critical and philos ophical tradition fromMarxism to poststructuralism.

Also offered for graduate-level credit as Eng 592 and may be taken only once forcredit.. Prerequisite: Eng 300 and Wr301. (Wr301 may be taken concurrently.).

## Eng 494 - Topics in Critical Theory and Methods

 (4)Specialized study of importantand influential strands in critical theory such as Marxism, psychoanalysis, feminism, postcolonialism, queer theory, and others. 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 594.. Prerequisite: Eng 300 and Wr 301. (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 theirstorytelling power by investigating the distinctive qualities of seminaltexts, 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 Wr301. (Wr 301 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 use of literary analy sis and cultural studies to illuminate environmental issues 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 English 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 -Selected Topics (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 complexmix of performance, spectatorship, cultural context, and theater history. Topics may be drawn from a range of historical periods, frommedieval drama to the present day.
Also offered for undergraduate-level credit as Eng 411 and may be taken only once for credit. .
Prerequis ite: Eng 300..

## Eng 513 - Teaching and Tutoring Writing (4)

Study and practice of writing instruction in various contexts, with focus on process, evaluation, and feedback.

Also offered for undergraduate-level credit 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-level credit as Eng 414 and may be taken only once for credit. .

## Eng 515-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 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 from classical through contemp orary contexts. Students will develop and pursue research projects according to their interests.

Also offered for undergraduate-level credit as Eng 416 and may be taken only once for credit. .

## 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 consentof 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 assistantship in English Department..

## Eng 519 - Advanced College Composition Teaching (1)

Continues the development of the theoretical and practical expertise of the graduateteaching assistant in advanced areas of college composition teaching. May be repeatedup to three times for credit. Required prerequisite: appointmentto 2 nd year teaching assistantship in English 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 culturallegacies of colonialism, 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 from the 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 upperdivision Literature/Writing credits.

## Eng 526 - Advanced Topics in Medieval Literature (4)

Study of Medieval English literature (c. 800-1500), including Anglo-Saxon works, continentalvernacular 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 forup 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 Renaissance epic and pastoral traditions; Elizabethan drama, verse narrative, satire, and invective; humanism; therise of the professional writer; literature and the visual arts. Expected preparation: Eng 341U and 4 additionalupper division Literature 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 forup to sixcredits.

## Eng 532-Old English (4)

An introduction to the history and grammarofold 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 ofOld 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 orconsent of instructor.

## Eng 534-OId English (4)

An introduction to the history and grammarofold English. This is the third 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 535 - Advanced Topics in Film and Media (4)

Specialized studies in the history, criticism, or theory of film and media culture. Topics may focus on genres, movements, figures, theoretical is sues, or advanced historical topics. Course may be repeated for credit with different topics. Up to 8 credits of this course number can beapplied 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 res toration drama. Expected preparation: Eng 341U orEng 342U and 4 additional upperdivision Literature credits.
Prerequisite:Eng 300..

## Eng 541 - Advanced Topics in Renaissance Literature (4)

Study of literature ofthe English Renaissance (15001700), including poetry, prose, drama, and other popular forms. Topics include cultural forces such as Humanismand 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. Prerequisite: 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 criticismand 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-level credit 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: 8additionalupper divis ion Literature credits.
Also offered for undergraduate-level credit as Eng 447. . Prerequisite: Eng 300..

## Eng 548 -Advanced Topics: Major Figures in Literature (4)

Study ofthe works of one or more major authors such as Chaucer, Woolf, Coetzee, or Morrison.

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 undergraduate-level credit 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-level credit 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, thenovel, gender and literature, abolitionism, or the culture of sympathy); genres, modes, or forms; or the relation of writing to historical events (slavery, revolution, colonialism, capitalism). Course may be repeated for credit with different topics. Up to 8 credits of this course number can beapplied 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 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 beapplied 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 his tory, ideas, and culture of the period. Topics may include literary movements (such as Trans cendentalism, sentimentalism, realism); individual authors; genres, modes, or forms; or writing's relation to historical events (such as slavery and abolition, theCivil 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 HarlemRenaiss ance); individual authors; genres, modes, or forms; or writing's relation to his torical events (the Cold W ar, 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 undergraduate-level credit as Eng 464. . Prerequisite: Eng 300..

## Eng 567 - 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 beapplied to the English 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 prerequisite: 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: As sian American and Pacific Is lander Studies; comparative and critical ethnic studies; ecocriticism and sustainability; immigration and settler colonialism. Course may be repeated for credit with different topics. Up to 8 credits of this course number can be applied to the Eng lish major.
Also offered for undergraduate-level credit as Eng 469. . Prerequisite: Eng 300. Expected preparation: Eng 369U and 4 additional upper divis ion Literature credits..

## Eng 575 - Advanced Topics in Victorian Literature (4)

Study of Victorian literature in the context ofthe 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. 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 undergraduate-level credit 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-level credit 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 division Literature credits.
Prerequisite:Eng 300..

## Eng 585-Contemporary Drama (4)

Examines major developments in world drama since World War II. Expected preparation: 8additional upperdivisionLiterature credits.
Prerequisite: Eng 300..

## Eng 586-Contemporary American Novel (4)

American novel since 1965, with emphas is upon traditions, themes and trends. Expected preparation: 8 additional upper division Literature credits.
Prerequisite: Eng 300..
Eng 587-Contemporary American ShortStory (4)

The American short story frommid-20th century to the present. Expected preparation: 8 additional upper divis ion Literature credits.

Prerequisite: Eng 300..

## Eng 588 - Contemporary American Poetry (4)

Study ofs ignificant 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 discourse. Students will develop and pursue research projects according to their interests. Coursemay be repeated for credit with different topics forup 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 philosophical 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 undergraduate-level credit as Eng 491 and may be taken only once for credit.

## Eng 592 - History of Literary Criticism and Theory II (4)

Historical survey ofsignificantworks in the Western critical and philos ophical 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 Feminist Literary

 Theory (4)Provides in-depth study of specific critical schools within the larger arena of feminist theory. Pos sible topics will include post colonialismand feminism; feminis $m$ and the body; historical perspectives on feminism. Course may be repeated for credit with different topics. Expected preparation: Eng 492 and 4 additionalupperdivision Literature credits.
Prerequisite: Eng 300..

## Eng 594 - Topics in Critical Theory and Methods

 (4)Specialized study of importantand influential strands in critical theory such as Marxism, psychoanalysis, feminism, postcolonialism, queer theory, and others. 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 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 instructor.

## 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: Upper-division standing..

## Eng 597 - 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 theirstorytelling power by investigating the distinctive qualities of seminaltexts, 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-level credit as 497 and may be taken only once for credit..

## Eng 598 - Ecology, Criticism, and Culture (4)

Examines ecologicalperspectives on the study of literature, culture, and critical theory as well as the use of literary analysis 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 systemdynamics. Relates to separate laboratory course using quantitative techniques for conceptualizing and analyzing movement of energy and material at local and global scales. Co-requisite: EnvE 368. Expected preparation: Admis sion to EnvE Upper 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 assessment of water quality properties important in environmental engineering. Co-requisite: ENVE 369.

Prerequisite: Ch 222/Ch 228, Ph 223 (or Ph 213)/Ph 216, MTH256. Corequisite: EnvE369.
EnvE 368-Physical Environmental Process Lab (2)

Laboratory and field exercises to accompany
Physical Environmental Processes (EnvE365).
Requires concurrent enrollment in EnvE365.
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 (EnvE 366). Requires concurrent enrollment in EnvE 366.

Prerequisite: Ch 222/Ch 228, Ph 223 (Ph 213)/Ph 216, Mth 256. Corequisite: EnvE366.

## EnvE 370-Sampling, Analysis and Risk Ass essment for Environmental Engineering Lab (2)

Synthesis of analytical chemistry and water quality knowledge. Laboratory and field exercises to implement water quality as sessment 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 ofepidemiology 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 influenceor determine these distributions. 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 addressquestions 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 612 and may be taken only once for credit..

## Epi 513 -Epidemiology II (4)

This course is the second in a three-course sequence 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 ofeffect/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 ofbias, confounding, and interaction (effect modification) in data derived fromepidemiological studies. Problemsolving exercises will focus on study designs and analys is. Written homework assignments and problem-oriented learning will occupy a central role in facilitating mastery of epidemiologic methods and issues.

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 legis lated regulation. Teaching will emphasize the problem-oriented seminar method.

Also offered as Epi614.. Prerequisite: Epi512 and Bsta 525 ..

## 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 briefliterature review of the public health need for the research. Students work in pairs to plan, organize, and conduct analyses leading to final oral and written presentations of their findings. Class time allows for hands-on experience with dataquality as sessment, preparation of datasets and variables for analys is, and multivariable modeling. Emphasis is on planning and communicating analytic plans that reflect the causal 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 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 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 their question 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, control of bias and confounding, and statistical analysis. Limited time will be spent on an introduction to budget development and project management. The major productof the course is the completion of a research proposal, which will be prepared according to the submission 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: Epi 512..

## 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 transmission of the HIV infection will be emphasized and public health prevention strategies will be evaluated. The global HIV 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 importantissues 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 discussions 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 global perspective. Although offered to Masters Level, MPH students, other health profes sions students often register. Global Health Epidemiology is a required course for students enrolled in the Concentration in GlobalHealth Studies Programfor epidemiology students.
Prerequisite: Introductory epidemiology and biostatistics courses..

## Epi 568 -Infectious Dis ease Epidemiology (2)

This course provides an introduction to infectious epidemiology, and includes fundamentaltopics such as outbreak investigation, public health communicable dis ease surveillance and reporting, biological concepts of disease introduction, evolution and spread, and design of population-based studies to valuate features of infectious diseases (e.g., risk factors, method ofspread, clinical features, dis ease prevalence). This course will also introduce some of
the categories of communicable diseases and highlight some features of the major dis eases 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 Dis ease 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 dis eases in developed countries. It covers three aspects of chronic dis ease: 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 diseases. The course is based on presentations by researchers and public health practitioner experts on specific chronic dis ease 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.. Prerequisite: Epi 512.

## Epi 603 -Diss sertation (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:Epi610.

## Epi 612 -Epidemiology I (4)

Epidemiology I introduces the concepts, principles and methods of epidemiology to graduate students in the Schoolof Public Health. Epidemiology is one of the fundamental sciences used by public health profes sionals 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 influenceor determine these distributions. 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 addressquestions about the dis tribution 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 Epi512 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 des igning case-controlstudies, 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 fromepidemiologicalstudies. Problemsolving exercises will focus on study designs and analys is. Written homework as signments and problem-oriented learning will occupy a central role in facilitating mastery of epidemiologic methods and issues.

Also offered as Epi 513.. Prerequisite: Epi 612 and Bsta 525..

## Epi 614 -Epidemiology III (4)

Will address the amount and types ofdata needed to establish and defend ideas of causation of community
health problems. Will illus trate how dataare most effectively translated into health agency policy, public testimony, and/or legis lated regulation. Teaching will emphas ize the problem-oriented seminarmethod.

Also offered as Epi 514.. Prerequisite: Epi 613 and Bsta 525..

## Epi 630 - Epidemiology Journal Club (1)

This is an elective course for epidemiology track masters students. Doctoralstudents 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 sessions, the instructor, guest faculty, and students will prepare a peer-reviewed article for class discussion that demonstrates or involves innovative public health content or methods. A secondary goalof this class is to prepare students to performpeer-review thems elves (e.g., for journals, study sections) by examples of this work from faculty.

## 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 theNHANES variables and a brief literature review of the public health need for the research. Students work in pairs to plan, organize, and conduct analyses leading to final oral and written presentations of their findings. Class time allows for hands-on experience with dataquality assessment, preparation of datasets and variables for analys is, and multivariable modeling. Emphasis is on planning and communicating analytic plans that reflect the causal models generated by students and allow for assessment of confounding and interaction (effect measure modification).

Also offered as Epi 536.. Prerequisite:Epi613, Epi 614, Bsta 612, Bsta 613, and Bsta $515 .$.

## Epi 640 - Res earch 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 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.
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 theskill set of prior epidemiologic methods, research, and biostatistical courses into a deeper contemplation and synthesis across methods and theories in epidemiology.

## Epi $\mathbf{6 6 0}$ - 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 coursespecific teaching assistant (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 form for these Sakai activities and submit to the OHSU Teaching and Learning Center). 3. Support the development and distribution of course materials for students and the instructor. 4. Support theevaluation of students' assigned work, including homework, quizzes and tests, termpapers, small group activities, computer-lab assignments, etc. 5. Prepare and deliver one or more coursesessions under the supervisor of the faculty/course instructor mentor.

## Epi 668 -Infectious Disease Epidemiology (2)

Provides an introduction to infectious epidemiology, and includes fundamental topics 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 spread, 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 Epi568 and may be taken only once for credit.. Prerequisite: Epi512 and Bsta 512.

## Epi 676 -Chronic Dis ease Epidemiology (2)

Gives students an understanding of the epidemiology of major chronic diseases in developed countries. It
covers three aspects of chronic disease: 1) epidemiology methods used in their study, 2) epidemiologic findings and currentstatus of epidemiologic research into various chronic diseases, 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.
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-causal, ecological, adaptive systems, and risk-assessment frameworks. Includes consideration ofbiological, chemical, and physical agents in the environment, which influence public health and well-being. Recommended prerequisite: graduate standing.
Also offered as ESHH611..

## 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 ESHH612 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 complexways. 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/orreemergence of vector-borne diseases; changes in food safety and food security; and population
displacement or civilunrest. Theseverity of impacts and the affect on burden ofdis ease 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 W orker 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 Ass essment (4)

This course covers the toxicological as pects of chemicals in the environment as well as risk assessment. Methods for both human health and ecological risk assessment will be presented including hazard identification, exposure assessment, dose-response relationships, risk communication, and toxicity testing. While there are no prerequisites, a good foundation in chemistry and familiarity with environmentalscience are recommended.

## ESHH 530 - Environmental 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 prerequisites.

## 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 resources, and environmental sustainability. In addition to fundamental knowledge in biology, students will demonstrate understanding of environmental inter-relationships and contemporary environmental is sues.

## 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 risk-assessment frameworks. Includes consideration of biological, chemical, and physical agents in the environment, which influence public health and well-being. 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 once forcredit..

## ESHH 621 - Principles of Occupational Health (4)

Occupational Health students will learn about the current Total W orker Health ${ }^{\circledR}$ approach to creating safe and healthful work environments. This perspective emphasizes the integration of traditional controls to protect workers frominjury 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 521..

## ESM - Environmental Sci \& Mgmt

ESM 100 - Portland's Environment (4)
Highlights aspects of Portland's environmentthat make it a great place to learn. Four sections: 1) Great Things - Portland's natural and social as sets, 2) Challenges and human impacts, 3) Possible solutions

- experiments in science and management, and 4)

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 urban streams, 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 Environmental Science.
Corequisite: ESM 101.

## ESM 102 -Environmental Sciences II(4)

Introduction to the analytical study of the interaction between humans and theenvironment. This term will focus on is sues of environmental degradation. Topics will include human population growth, pollution of the air and water, energy resource use, and social and economic basis 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, pre-requisite 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 terres trial, aquatic, and atmospheric systems, 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, one 3-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 pre-requisitebe 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 problemsolving, sampling, design for quantitative sampling, and measurement.
Prerequisite: ESM 220 or (ESM 101 and ESM 102); Math 111 (instructor will waive this prerequis ite with an ALEKS score of $>59$ ). Corequisite: ESM 221L.

## ESM 221L-Applied Environmental Studies: Problem Solving Lab (0)

Lab for Applied Environmental Studies: Problem Solving.
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, soil chemistry, 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 sequence of two: ESM 230 and ESM 231 and must be taken in sequence.

Prerequisite: ESM 230.. Corequis ite: 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 threehour 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 four credits 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. Corequisite: ESM 324.
Prerequisite: ESM 320, ESM 323.. Corequisite: ESM 324.

## ESM 322 - Environmental Risk As sessment (4)

Overview of risk ass essment applied to environmental problems, including the impact ass essment process, application of cost-benefit analys is, hazard identification, risk characterization, risk assessment, 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 environmental risk assessment. Emphasis is on laboratory acute and chronic toxicity tests and field biological streamas 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 theenvironment. 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 analyzing 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 andunder what authority. Introduction to general theory ofenvironmental management and strategies that are being used. Case studies of local management project and is sues.
Prerequisite: ESM 222. .

## ESM 340 - Res earch 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 analyses, and data interpretations.

## ESM 342 - Field Methods (2)

Presents crucial safety, field and research skills for environmental research. Presents differentskill 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 EcosystemDamage from Human Impacts (4)

Inquiry based course that addresses many problems that can be addressed through environmental
restoration. Analysis of potential solutions based on ecological 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- Unders tanding Environmental Sus tainability 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 ecosystem properties, earth systemproperties, human population dynamics, and the roles of technological and ethical decisions. Not intended for science majors.

## ESM 356U- Unders tanding Environmental Sus tainability II (4)

Introduction to the concepts and principles necessary to understand the complex relationship between humans and environmental sustainability. Topics will include natural resources is sues with a focus on nature's services, the global cris is in water, biodiversity, and food; soil function, the fate of environmental toxins 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 scienceperspectives and business perspectives 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, costand scale-effective approaches. .

## ESM 399 - Special Studies (1-9)

See department for course description. (Credit to be arranged.)

## ESM 401 - Res earch (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 oftopical environmental is sues. Maybe repeated for up to 3 credits.

## ESM 410 -Selected Topics (1-12)

Consent of instructor. See department for course description. (Credit to be arranged.)

## ESM 415 - Road Ecology (4)

Environmental impacts of roads and mitigation. Issues associated with road systemconstruction, maintenance, and operation. Projects on the ecologicaleffects 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.. Prerequis ite: any undergraduate environmental science course..

## ESM 416 - Ecosys tem Restoration (4)

Ecological theories and principles that guide restoration practices in a variety ofecosystems, 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 ecosystem restoration.

Also offered for graduate-level credit as ESM 516 and may be taken only once for credit. . Prerequisite: ESM 335 or Geog 345 U or Bi 357 or ESM 321.

## ESM 417 - Applied WatershedRestoration (4)

Fundamentals of applied watershed/stream restoration: hydrologic, hydraulic, geomorphic, and ecological principles and tools applicable to the assessment of watershed and reach-scale processes and evaluation of streamchannel condition. Emphas is on the inter-related nature of physical processes and aquatic and riparian ecology at both the watershed and reach-scale.

Also offered for graduate-levelcredit as ESM 517 and may be taken only once for credit. Prerequisite: Upper-divis ion standing..

## ESM 418 - 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 inter-acting ecological communities. Expected preparation: Geog 313 orBi 357. Upper-divisionstanding required. This is the same course as Geog 418 and may be taken only once forcredit.

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 environmentalcontaminants 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 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 hydrologic setting and requirements for wetland delineation.

Also offered for graduate-level credit as ESM 524 and may be taken only once for credit..

## ESM 425-Watershed Hydrology (4)

Study of the movementand storage of water in waters heds, emphasizing physical processes. Includes systems analysis of watersheds, precipitation, snowmelt, infiltration, evapotranspiration, groundwater 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 stream development, biological communities, ecological processes, and methods of assessment as applied to evaluation of common environmental problems.
Also offered for graduate-level credit as ESM 526 and may be taken only once for credit..

## ESM 427 -Watershed Biogeochemistry (4)

Study of the chemis try of watershed-based ecosystems, emphasizing physical and biological processes. Mechanisms of atmospheric input; rock weathering and soil development; physical and biological controls on the storage and fluxof 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 for credit. .

## ESM 428 - Urban Ecology (4)

Study ofecological processes in urban environments. Emphasis on responses of flora and faunato changes in climate, hydrology, geomorphology, geochemistry, soils and available habitat in urban areas. Includes issues of species conservation, ecosystem management and sustainability in urban systems. Expected preparation: an undergraduate biology course orpermis sion of instructor.
Also offered for graduate-level credit as ESM 528 and may be taken only once for credit. .

## ESM 429 - Environmental Impact Assessment (4)

Environmental assessments and impact assessment techniques; regulatory and technical requirements of
impact assessment. The National Environmental Policy Act, its implementation, implications anduses.

Also offered for graduate-level credit as ESM 529 and may be taken only once for credit..

## ESM 433 - Natural Resource Economics (4)

An examination of the economic concepts and theories for analyzing natural resource useand 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 once for credit.. Cross-Listed as: Ec 433.

## ESM 434 -Business Environmental Management Economics (4)

Examines the economic costs and benefits that affect the decisions ofbusiness firms to develop integrated environmental managementsystems. 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 forcredit. Expected preparation: Ec 201.
Also offered for graduate-level credit as ESM 534 and may be taken only once for credit.. Cross-Listed as: Ec 434.

## ESM 435 - Natural Resource Policy and Management (4)

The impact of natural resource policy and management on regional and federal levels. Case studies will focus on the complexsettings, difficult socioeconomic contexts and charged political environments.

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 illustrating current management is sues regarding human en vironment interactions. Participants will learn management theory and concepts and apply this knowledge through field work conducting institutional analysis and presenting a group management plan for a local site.
Also 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 Environmental Science Management and Geography. This class focuses on the complex challenges of managing wildfire in integrated social and ecologicalsystems (SESs) and uses thewestern 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 environmentaleffects of trade and global commerce in developed and developing countries. This course is the same 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 westside old-growth forests, including their outstanding biodiversity. Landscape level aspects of forest ecosystems, including the role of fire; plus the use of basic fores try measurements to contrast old-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 for credit. .

## 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 science or environmental 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; adaptivemanagement. 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 issues 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 Res ponses : Geosphere and Anthrosphere (4)

Examination of the basis forhuman-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 graduatestanding in ESM..

## ESM 463 - 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 Stateof Oregon for
temperature, bacteria, chemical toxins and nutrients. Role of science in decisions protecting and restoring rivers from water 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 and Vulnerabilities (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 fromglobal change.

Also offered for graduate-level credit as ESM 564 and may be taken only once for credit. . Prerequis ite: 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. Emphas izes res ponse of native plants to physical and introduced species impacts from urbanization. Students will collect ecologicaland vis itor impact data in local parks, study is sues pertaining to sustainability and management based on an understanding ofshort termand longer-term disturbances.

Also offered for graduate-level credit as ESM 565 and may be taken only once for credit. . Prerequis ite: Environmentalstudies 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. Emis sion, dis persal, and removal ofnatural and man-made trace 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 differentialequations.

Also offered for graduate-level credit as ESM 571 and may be taken only once for credit.. Prerequisite: one yeareach 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 for credit.. 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 for credit. . 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 organics; 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: CE 479.

## 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 distribution 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 between marine and terrestrial/aquatic systems. The second part of the course will discuss the major threats to ocean systems. Thethird part of the course will focus on solutions in terms of protected areas, management and policy strategies, and various as pects of the human dimens ion. 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 BioInvasions (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 foodjustice, 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 once for credit.. 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.. Prerequisite: Senior or graduates tanding..

## ESM 499 - Special Studies (1-8)

See department for course description. Consent of instructor and programdirector. (Credit to be arranged.)

## ESM 501 - Res earch (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 aspects of research and thesis writing formaster'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)

W eekly seminar series on topical environmental issues. May be repeated for up to 3 credits forM.S. or M.E.M students.

## ESM 509-Practicum(1-9)

See department for course description. (Credit to be arranged.)

## ESM 510 -SelectedTopics (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. Issues associated with road systemconstruction, maintenance, and operation. Projects on the ecological effects of roads will bring real-world pers pectives to the class, 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 ofecosystem restoration.

Also offered for undergraduate-level credit as ESM 416 and may be taken only once for credit. .

## ESM 517 - Applied Watershed Restoration (4)

Fundamentals of applied watershed/stream restoration: hydrologic, hydraulic, geomorphic, and ecological principles and tools applicable to the assessment of watershed and reach-scale processes and evaluation ofstreamchannel condition. Emphasis on the inter-related nature of fhysical 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 ecologicalcommunities. Expected preparation: Geog 313 or Bi 357 . Upper-divisionstanding required. This is the same course as Geog 518 and may be taken only once for credit.

Also offered forundergraduate-level credit as ESM 418 and may be taken only once for credit.. CrossListed as: Geog 518.

## ESM 520 - Ecological Toxicology (4)

Effects ofenvironmental 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 organics, 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 emphas is 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 - Waters hed Hydrology (4)
Study of the movement and storage of water in watersheds, emphasizing physical processes. Includes systems analysis of watersheds, precipitation, snowmelt, infiltration, evapotranspiration, groundwater flow, streamflow generation, open channel flow, 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-level credit as ESM 425 and may be taken only once for credit. . CrossListed 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 assessment 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 -Watershed Biogeochemistry (4)

Study of the chemis try of watershed-based ecosystems, emphasizing physicaland biological processes. Mechanis ms of atmospheric input; rock weathering and soil development; physical and biological controls on the storage and fluxof minerals, carbon, and nutrients in terrestrial ecosystems; and impacts of managementon biogeochemical processes in watershed-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 faunato changes in climate, hydrology, geomorphology, geochemistry, soils and available habitat in urban areas. Includes is sues of species conservation, ecosystem management 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 assessment techniques; regulatory and technical requirements of impact assessment. TheNational Environmental Policy Act, its implementation, implications and uses.

Also offered for undergraduate-level credit as ESM 429 and may be taken only once for credit..

## ESM 533 - Natural Res ource 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 is sues 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 for credit.. CrossListed 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 managementsystems. 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 forcredit. Expected preparation: Ec 201.

Also offered for undergraduate-level credit as ESM 434 and may be taken only once for credit.. CrossListed as: Ec 534.

## ESM 535 - 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 complexsettings, difficult socioeconomic contexts and charged political environments.

Also offered for undergraduate-level credit 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 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 analysis and presenting a group management plan for a local site.

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 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 socialsciencebehind those challenges. The course adds field studies in NE Oregon to understand how integrated SESs manage wild fire and wildfire risks in practice.
Also offered for undergraduate-level credit as ESM 440 and may be taken only once for credit.. CrossListed as: This is the same course as Geog 540 and may be taken only once forcredit..

## 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.. CrossListed as: Ec 543.

## ESM 544 -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 undergraduate-level credit as ESM 444 and may be taken only once for credit. .

## ESM 545 - Old-growth Forest Ecology (4)

Exploration of the ecological characteristics of westside old-growth forests, including their outstanding biodiversity. Landscape level aspects of forest ecosystems, including the role of fire; plus the use of basic forestry measurements to contrast old-growth, second-growth, and plantation stands of frees. 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 for credit. .

## ESM 551 -Project Management for Scientists (4)

Managing a scienceor environmental project is unique, requiring knowledgeof 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 for credit. .
Prerequisite:upper-division standing..
ESM 552 -Environmental Regulation and Nonregulatory 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 issues, and interaction with businesses through innovation and performance based approaches. Case studies and group work included.

## ESM 554-Graduate Res earch Toolbox (4)

Students will develop experimental 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-Listedas: 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 poster based on cognitive and graphic design principles. They will create an extended outline for a res earch 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.. Cross-Listedas: 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 sciencestories, 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 urbanair quality issues 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 CE 588 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. . CrossListed as: CE 588.

## ESM 562 -Climate Change Impacts, Adaptations and Res ponses: Geosphere and Anthros phere (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 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 StateofOregon for temperature, bacteria, chemical toxins and nutrients. Role of science in decisions protecting and restoring rivers from water 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 oflocal actors to develop strategies that protect and facilitate human and environmental values under threat fromglobal change.

Also offered for undergraduate-level credit as ESM 464 and may be taken only once for credit..

## ESM 565 - Investigating Ecological and Social Issues in Urban Parks and Natural Areas (4)

Examines ecological and social aspects of urban forests. Emphasizes res ponseofnative plants to physical and introduced species impacts from urbanization. Students will collect ecological and vis itor 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 undergraduate-level credit as ESM 465 and may be taken only once for credit. .

## 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 distributions, simple and multiple and multivariate regression and their applications to analysis and modeling, and detection of changes and trends in
environmentaltime series. This is the same course as CE 566 and may be taken only once for credit.

Prerequisite: graduatestanding and Stat 243 and 244 or Stat 460.. Cross-Listed as: CE 566.

## ESM 567-Multivariate Analysis of Environmental Data (4)

Biological and environmental data are usually complex, cons isting of many observations and variables. This course provides an overview 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.
Prerequis ite: 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 assessment ofoutcomes. 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, dispersal, and removal of natural and man-made trace constituents in the atmosphere that determine the Earth's climate and stratospheric ozone layer. This is the same 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.. CrossListed 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 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 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-level credit 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; multiphase fugacity models oforganics; case studies of contaminated surface water, sediment and groundwater. This course is the same as CE 579 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.. CrossListed 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 distribution presented in the context ofboth oceanography and
coastal zone ecology. Marine conservation is sues, 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 terres trial/aquatic systems. The second part of the course will discuss the major threats to ocean systems. Thethird part of the course will focus on solutions in terms of protected areas, management and policy strategies, and various as pects of the human dimension.

Also offered for undergraduate-level credit as ESM 483 and may be taken only once for credit. .
ESM 585 - Ecology and Management of Bio-
Invasions (4) 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 foodjustice, 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 ecosystem services, processes of change in ecological systems, interactions among ecological and social systems,
economic valuation of ecosystemservices, and ecosystemmanagement.

## ESM 590-Ecosystem Services and Sus tainability:

 Developing a Toolkit(1)Ecosystemservices provide a conceptual framework for addressing ecological, social and economic sustainability. Students will learn to use an interd is ciplinary toolboxofmethods and techniques useful for assessing various aspects of ecosystem services. Students will develop a project proposal on a real-world application of ecosystemservices assessments 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 unifying conceptual model connecting biophysical and social parameters linked by ecos ystemservices, human perspectives, behaviors and institutional policies in coupled natural and human systems. This is the same 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 from term 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 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 and Sus tainability: Developing a Toolkit (1)

Ecosystemservices provide a conceptual framework for addressingecological, social and economic sustainability. Students will learn to use an interd isciplinary toolboxof methods and techniques
useful for assessing various aspects of ecosystem services. Students will develop a project proposal on a real-world application of ecosystemservices assessments 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. Maybe repeated for up to 3 credits.

## ESR 507 - Seminar (1-6)

Weekly seminar series on topical environmental issues. 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 dissertation.

## 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 Sciencein Environmental Research (3)

This course draws on representatives from research 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 problembased approaches fromsocial, physical and biological sciences.
Prerequisite: PhD student or MS with permission 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-Listedas: 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 fora 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.

Cross-Listedas: ESM 556.

## ESR 657 - Science, Media and the Public: Working with the Media to Create Effective Scientific Mes sages (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 sciencestories, 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 ESM 557 and may be taken only once forcredit.
Cross-Listedas: 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 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 same course as ESM 592 and Soc 692 and may be taken only once forcredit.

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 our culture 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 -Selected Studies (1-6)

(Credits to be arranged.)

## ETM 501-Research (1-9)

(Credit to be arranged.)

## ETM 503 - Thesis (1-9)

(Credit to be arranged.)

## ETM 504 - Cooperative Education/Internship (19)

(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 professional technology managers and leaders are called on to producereports, 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. Emphasis on creativity, organization, 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.

Also offered as ETM 611 and may be taken only once for credit..

## ETM 518 -Ethical Issues in Technology Management (4)

Designed to meet the needs of engineers who are or will be moving into greater responsibility 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 businessworld today.

Also offered as ETM 618 and may be taken only once for credit..

## 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.

Also offered as ETM 619 and may be taken only once for credit.

ETM 520-Management of Engineering and Technology (4)

Study offundamental concepts of engineering and technology management to provide thestudents with an in-depth 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 system interfaces in existing and emerging technologies are discussed. Ongoing engineering and technology management research is critically evaluated in clas sroom discussions. Case studies and teamprojects are included.

Also offered as ETM 620 and may be taken only once for credit.

## ETM 522-Communication and Team Building

 (4)Developinghigh performance teams for engineeringand technology-driven companies; fundamental concepts that make an effective team; building a high-performance team; the keys to high performance; converting risks into assets; the power of commitment and discipline, and constructive communication; getting results through team dynamics, creative problemsolving, and interactive exercises.

Also offered as ETM 622 and may be taken only once for credit. . Prerequisite: graduate standing or consent of instructor..

## ETM 525 -Strategic Planning (4)

Critical issues 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. Identify ing planning as sumptions, critical issues, setting objectives, formulating strategy. Leadership, organizational culture, and structure to support the implementation of a strategic plans well as the strategic control systems. Case studies, presentations, termprojects, teamwork, and interactive exercises.

Also offered as ETM 625 and may be taken only once for credit. . Prerequisite: graduate standing or consent of instructor..

## ETM 526 - Strategic Management of Technology

 (4)Analyses of the structure and competitive dynamics of technology-driven industries; resource-and knowledge-based frameworks for competitive advantage, which are applied to technology-driven industries; as well as a discussion of corporate, international and global strategies for technologydriven ventures.
Also offered as ETM 626 and may be taken only once for credit..

## 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 historical perspective on the evolution of competitive strategy theory and techniques including their foundations with key concepts and issues from strategic management thought leaders and present examples of the application of those concepts in businesssituations. Covers frameworks and tools used for strategy analysis, development and implementation.

Also offered as ETM 627 and may be taken only once for credit. . Prerequisite: graduate standing or consentof instructor..

## ETM 530 -Decision Making (4)

Decis ion and value theory concepts are applied to technical and management decisions under uncertainty. Multi-criteria decisions are analyzed. Subjective, judgmental values are quantified for expert decisions and conflict resolution in strategic decis ions involving technological alternatives. Hierarchical decis ion modeling approach is introduced. Individual and aggregate decisions are
measured. Decision discrepancies and group disagreements are evaluated. Case studies are included in the course.

Also offered as ETM 630 and may be taken only once for credit. .

## ETM 531 - Technology Ass essment \& Acquisition (4)

Fundamental concepts of assessing technologies including evaluation attributes and methodologies, impacts and impact relationships, and technology diffusion fromindividual, organizational, technical and market perspectives. Casestudies, professional and research articles, and guest speakers fromlocal companies included.
Also offered as ETM 631 and may be taken only once for credit..

## 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 fromlocal companies, and recently published books.

Also offered as ETM 632 and may be taken only once for credit..

## ETM 533 - Technology Transfer (4)

Fundamental concepts of transferring technologies. Topics include university, industry and government collaboration fortechnology development, transfer of technologies from labs into product groups, research and development consortia, and international technology transfer. Case studies, professional and research articles, and guest speakers fromlocal companies included.

Also offered as ETM 633 and may be taken only once for credit..

## ETM 534-Technology Roadmapping (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 particulargroup of stakeholders in a technology or applicationarea.

Also offered as ETM 634 and may be taken only once for credit..

## ETM 535 - Advanced Engineering Economics (4)

Economic evaluation of engineering and RD projects is covered fromthe engineering management viewpoint. Time value of money, taxconsiderations, break-even analysis, sensitivity analysis, project evaluations under uncertainty, risksharing, capital budgeting, financial ratios, and cost estimating techniques are studied. A business simulation game is used throughout the course to gain a better understanding of financial decision making.
Also offered as ETM 635 and may be taken only once for credit. . Prerequis ite: graduate standing or consent of instructor, knowledge of probability/statistics..

## ETM 536-RDM: R\&D Management (4)

Managerial aspects of Res earch and Development (RD) including special issues in managing research at national labs, university settings, and industry labs. Reviews evaluation methods and multiobjective analys is used for R\&D project selection. Development analyzed across the following venues: Roadmap Development, Eco systemDevelopment, 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 ongoing RD outputs.
Also offered as ETM 636 and may be taken only once for credit..

## ETM 537 - Benchmarking Using Data Envelopment Analysis (4)

This course focuses on data envelopment analysis, a powerful and flexible technique forquantitative benchmarking and productivity analysis. Applications and case studies from a wide range of areas including engineering, health care, education, financial services, new product development, technology forecasting, and non-profit organizations will be included.

Also offered as ETM 637 and may be taken only once for credit. . Prerequisite: graduate standing or consentof instructor, 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 organize datain a data warehouse; complications in designing a data warehouse system; and identify ing resources.
Also offered as ETM 638 and may be taken only once for credit..

## ETM 540-Operations Research (4)

Covers the use ofoperations research techniques in making engineering and technology management decisions. The primary emphasis 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. Postoptimality analysis is studied fromthe viewpoint of technology management. Other operations research techniques such as queuing models will also be covered. The course includes a termproject involving an actual operations problem.

Also offered as ETM 640 and may be taken only once for credit. . Prerequisite: graduate standing or consentof instructor..

## ETM 543 -Front End Management for New Product Development (4)

Provides students with an understanding of the activities and challenges of managing the early stages of new product development, the so-called "fuzzy front-end". It covers concepts, methods and tools for bridging the gap between strategic planning and new product development, for identifying opportunities, for generating and selecting product ideas, for developing product concepts, and for selecting new product development projects.
Also offered as ETM 643 and may be taken only once for credit..

## ETM 544-Organizational Project Management

(4)

Covers the strategic components which drive the integration of initiatives, goals and projects within an organization. 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 vis ion. Includes coverage of macro level project managementtopics such as project management maturity models and the micro levelsuch as agile project management.

Also offered as ETM 644 and may be taken only once for credit..

## ETM 545 - Project Management (4)

Critical issues in the management of engineering and high technology projects; analysis of time, cost, performance parameters from the organizational, people, and resource perspectives; project planning evaluation and selection, including projectselection models; project and matrixorganizations; project teams; scheduling and termination of projects. Case discussions and termproject are included in the course.

Also offered as ETM 645 and may be taken only once for credit. .

## 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. Anemphasis 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.
Also offered as ETM 646 and may be taken only once for credit. . Prerequisite: ETM 545/645 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 publis hed articles addressing these is sues. Students develop a plan for a new product including risk assessments in areas such as manufacturing, design, and testing.
Also offered as ETM 647 and may be taken only once for credit..

## 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. Emphasis will be on semiconductor technology and manufacturing but most principles and methodologies are generally applicable to both hardware and software.

Also offered as ETM 648 and may be taken only once for credit..

## ETM 549-Management of Technology Innovation (4)

Describes and explains phenomena pertaining to technological innovation. Focus on the interplay between engineering/technology and theeconomical, cultural, psychological, social and technical aspects of the engineering environment. Provides technology managers a toolkit to make engineering and technical innovations successful. Also covers how engineering and technology management enables technological innovation.

Also offered as ETM 649 and may be taken only once for credit..

## 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.

Also offered as ETM 650 and may be taken only once for credit. . Prerequisite: graduate standing..

## ETM 551 -Manufacturing Sys tems 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, enterprise requirements planning, and concurrent engineering.
Also offered as ETM 651 and may be taken only once for credit. . Prerequisite: Background in manufacturing at the level of ETM 550/650 or equivalent, or consent of ins tructor..

## ETM 553 -Manufacturing Systems Simulation (4)

Introduction of dis crete simulation techniques for the modeling of randomprocesses and probabilistic events in the simulation ofmanufacturing systems; concepts of systems modeling with emphasis on the use of an animated simulation package throughout the course.

Also offered as ETM 653 and may be taken only once for credit. . Prerequisite: graduate standing or consentof instructor, basic knowledge of probability and statistics..

## ETM 555 - Technology Marketing (4)

This course is designed to introduce students to the special issues 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 analysis and positioning, and distribution strategies. Emphasis is placed on strategies for marketing technology products in industrial markets. Alsop offered as ETM 655 and may be taken only once for credit.

Prerequisite: graduatestanding or consent of instructor..

## ETM 556 - User-CenteredInnovation (4)

Introduction to the various strengths and weaknesses of approaches to innovation. Focuses on a customerdriven methodology and introduces the increasingly prominent role ofdesign in creating memorable experience, and emotional connection with a product and/or a company.

Also offered as ETM 656 and may be taken only once for credit..

## ETM 558-Engineering Financial Management (4)

Teaches key concepts offinancial and cost management and their linkage to overall business strategies for nonfinancial managers. Emphasizes the educational needs and perspective of functional and project managers in engineering and research.
Prerequisite: graduatestanding..

## 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.

Also offered as ETM 659 and may be taken only once for credit..

## 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, term projects, and teamwork.

Also offered as ETM 660 and may be taken only once for credit. . Prerequisite: graduate standing or consent of instructor..

## ETM 561 - Technology Entrepreneurship (4)

Examines how to start and grow a high technology company or high 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 business around technology that they develop, write a business plan and present their technology business idea to a financier.

Also offered as ETM 661 and may be taken only once for credit.

## ETM 562 - New Venture Management (4)

Explores actualemerging technologies that are likely to impact or create technology-based industries in the next 1-5 years, and gives a framework for identifying, analyzing, acquiring, implementing and finally commercializing leading-edge technologies into new products or services.

Also offered as ETM 662 and may be taken only once for credit.

## ETM 563 -Intrepreneurshipin Technology (4)

The development of new products and services is fundamental to sustaining a long-term competitive advantage. The efforts of the individual or teamof entrepreneurs who are responsible 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.
Also offered as ETM 663 and may be taken only once for credit. . Prerequisite: Graduate standing. Expected preparation:ETM 555/655 and ETM 535/635..

## 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 res earchers. 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 statistical techniques 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 display of quantitative
information. Probability and statistics or consentof instructor.

Also offered as ETM 665 and may be taken only once for credit. Prerequisites: .

## ETM 567 - Knowledge Management (4)

Introduction to some of the critical is sues and debates in knowledge management. Stresses the human and business aspects of knowledge management. Taught from the perspective of the user oftechnical tools and methods.

Also offered as ETM 667 and may be taken only once for credit..

## ETM 568 - Energy Technology Innovations (4)

Reviews management of technology and innovation in the energy sector. Specifically, focuses on the technology developmenthighlighting the unique differences of the energy sector.
Also offered as ETM 668 and may be taken only once for credit. . Prerequisite: graduate standing..

ETM 570 - Role of Government in Technology Management (4)
In their desire to grow theirnation'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.

Also offered as ETM 670 and may be taken only once for credit..
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.

Also offered as ETM 671 and may be taken only once for credit..

## 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.
Also offered as ETM 673 and may be taken only once for credit..

## 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 org anizational interactions of research in science and technology to create national technical capabilities for economic development.
Also offered as ETM 675 and may be taken only once for credit. . Prerequisite: graduate standing..

## ETM 589 - Caps tone 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 ofengineering and technology management into an individual or group project. The research base for the project may come fromany combination of the study areas covered in Engineering and Technology Management.
Prerequis ite: Completion of at least seven courses in the MS ETM curriculum or permission of ins tructor..

ETM 601 -Research (1-12)
(Credit to be arranged.)

ETM 602 -Independent Study (1-4)
(Credit to be arranged.)

## ETM 603 -Diss ertation (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 - SelectedTopics (1-9)

(Credit to be arranged.)

## ETM 611 - Technology Management Writing and Presentations (4)

Students will learn to develop written deliverables and presentations thatprofessional technology managers and leaders are called on to producereports, analyses, persuasive write-ups, announcements, presentations (prepared and impromptu), proposals and websitecontent. Students will examine and critique examples of professional communications, as wellas edit the works of others in the class. Emphasis on creativity, organization, voice, audience and objectives for the communications. Discussiontopics also include professional writing standards-ethics, research and references, style considerations and requirements - as well as how to structure, organize and present academic writing.
Also offered as ETM 511 and may be taken only once for credit..

## ETM 618 - 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 businessworld today.

Also offered as ETM 518 and may be taken only once for credit..

## ETM 619-Human Side of Technology Management (4)

Introduction to leadership and human resource management issues that technical managers are confronted with while managing their culturally diverse workforce of technicians, scientists and engineers.

Also offered as ETM 519 and may be taken only once for credit..

## ETM 620 -Management of Engineering and

Technology (4)
Study offundamental concepts ofengineering and technology management to provide thestudents with an in-depth 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 classroom discussions. Case studies and teamprojects are included.

Also offered as ETM 520 and may be taken only once for credit.

## ETM 622 -Communication and Team Building (4)

Developing high performance teams for engineeringand technology-driven companies; fundamental concepts that make an effective team; building a high-performance team; the keys to high performance; converting risks into assets; the power of commitment and discipline, and constructive communication; getting results through team dynamics, creative problemsolving, and interactive exercises.

Also offered as ETM 522 and may be taken only once for credit. . Prerequisite: graduate standing or consentofinstructor..

## ETM 625-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) andsituational analysis including strengths, weaknesses, opportunities, and threats in KRAs. Identifying planning as sumptions, critical issues, setting objectives, formulating strategy. Leadership, org anizational culture, and structure to support the implementation of a strategic plans well as the strategic control systems. Case studies, presentations, termprojects, teamwork, and interactive exercises.

Also offered as ETM 525 and may be taken only once for credit. . Prerequisite: graduate standing or consentof instructor..

## ETM 626 -Strategic Management of Technology

 (4)Analyses of the structure and competitive dynamics of technology-driven industries; resource- and knowledge-based frameworks for competitive
advantage, which are applied to technology-driven industries; as well as a discussion of corporate, international and global strategies for technologydriven ventures.
Also offered as ETM 526 and may be taken only once for credit..

## ETM 627 - 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 historical perspective on theevolution of competitive strategy theory and techniques including their foundations with key concepts and is sues from strategic management thought leaders and present examples of the application of those concepts in bus inesssituations. Covers frameworks and tools used for strategy analysis, development and implementation.
Also offered as ETM 527 and may be taken only once for credit. . Prerequis ite: graduate standing or consent of instructor..

## ETM 630 -Decision Making (4)

Decis ion and value theory concepts are applied to technicaland management decisions under uncertainty. Multi-criteria decis ions are analyzed. Subjective, judgmental values are quantified for expert decisions and conflict resolution in strategic decisions involving technological alternatives. Hierarchical decis ion modeling approach is introduced. Individual and aggregate decis ions are measured. Decision discrepancies and group dis agreements are evaluated. Case studies are included in the course.
Also offered as ETM 530 and may be taken only once for credit. .

## ETM 631 - Technology Ass essment \& Acquisition (4)

Fundamental concepts of as sessing technologies including evaluation attributes andmethodologies, impacts and impact relationships, and technology diffusion fromindividual, organizational, technical and market perspectives. Casestudies, professional and research articles, and guest speakers fromlocal companies included.
Also offered as ETM 531 and may be taken only once for credit..

## ETM 632 - 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 res earch articles, guest speakers fromlocal companies, and recently published books.

Also offered as ETM 532 and may be taken only once for credit..

## ETM 633 - 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 consortia, and international technology transfer. Case studies, professional and research articles, and guest speakers fromlocal companies included.
Also offered as ETM 533 and may be taken only once for credit..

## ETM 634 - Technology Roadmapping (4)

Introduces Technology Roadmapping (TRM), which provides a structured approach for exploring and communicating therelationships 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 as essed. Roadmaps also seek to capture the environmental landscape, threats and opportunities for a particular group of stakeholders in a technology or applicationarea.
Also offered as ETM 534 and may be taken only once for credit..

## ETM 635 -Advanced Engineering Economics (4)

Economic evaluation ofengineering and RD projects is covered from the engineering management viewpoint. Time value of money, taxconsiderations, break-even analysis, sensitivity analysis, project evaluations under uncertainty, risk sharing, capital budgeting, financial ratios, and cost estimating techniques are studied. A business simulation game is used throughout the course to gain a better understanding of financial decision making.
Also offered as ETM 535 and may be taken only once for credit. . Prerequisite: graduate standing or consent of instructor, knowledge of probability/statistics..

## ETM 636-RDM: R\&D Management (4)

Managerial aspects of Research and Development (RD) including special is sues in managing research at national labs, university settings, and industry labs.

Reviews evaluation methods and multiobjective analys is used for R\&D project selection. Development analyzed across the following venues: Roadmap Development, Eco systemDevelopment, 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 ofR\&D; and the difficulties in measuring ongoing RD outputs.

Also offered as ETM 536 and may be taken only once for credit..

## ETM 637 - Benchmarking Using Data Envelopment Analysis (4)

This course focuses on data envelopment analysis, a powerful and flexible technique forquantitative 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 non-profit organizations will be included.

Also offered as ETM 537 and may be taken only once for credit. . Prerequisite: graduate standing or consent of instructor, linear programming..

## ETM 638-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 decis ion support systems; how to organize datain a data warehouse; complications in designinga data warehouse system; and identify ing resources.
Also offered as ETM 538 and may be taken only once for credit..

## ETM 640 - Operations Research (4)

Covers the use ofoperations research techniques in making engineering and technology management decisions. The primary emphasis is placedon 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. Postoptimality analysis is studied fromthe viewpoint of technology management. Other operations research techniques such as queuing models will also be covered. The course includes a termproject involving an actual operations problem.
Also offered as ETM 540 and may be taken only once for credit. . Prerequis ite: graduate standing or consentof instructor.

## ETM 643 - Front End Management for New Product Development (4)

Provides students with an understanding of the activities and challenges of managing the early stages of new product development, the so-called "fuzzy front-end". It covers concepts, methods and tools for bridging the gap between strategic planning and new product development, for identifying opportunities, for generating and selecting product ideas, for developing product concepts, and for selecting new product development projects.

Also offered as ETM 543 and may be taken only once for credit..

## ETM 644-Organizational Project Management

 (4)Covers the strategic components which drive the integration of initiatives, goals and projects within an organization. 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.
Also offered as ETM 544 and may be taken only once for credit..

## ETM 645-Project Management (4)

Critical issues in the management ofengineering and high technology projects; analysis of time, cost, performance parameters from the organizational, people, and resource perspectives; project planning evaluation and selection, including projectselection models; project and matrixorganizations; project teams; scheduling and termination of projects. Case discussions and term project are included in the course.
Also offered as ETM 545 and may be taken only once for credit. .

## ETM 646-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. Anemphasis is placed on the integration of the techniques in the areas. The contingency approach to designing a project management toolboxbased on the three areas oftime, cost, and risk management is included.

Also offered as ETM 546 and may be taken only once for credit. . Prerequisite: ETM 545/645 or project management experience..

## ETM 647 - New Product Development (4)

Examines complete product developmentprocess and key issues 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 assessments in areas such as manufacturing, design, and testing.
Also offered as ETM 547 and may be taken only once for credit..

## ETM 648 -Managing New Technology Introduction (4)

Management procedures and key underly ing concepts for effective planning, development, and introduction into volume production utilizing new technology are covered. Emphasis will be on semiconductor technology and manufacturing but most principles and methodologies are generally applicable to both hardware and software.
Also offered as ETM 548 and may be taken only once for credit..

ETM 649 - Management of Technology Innovation (4)
Describes and explains phenomena pertaining to technological innovation. Focus on the interplay between engineering/technology and the economical, cultural, psychological, social and technical aspects of the eng ineering environment. Provides technology managers a toolkit to make engineering and technical innovations successful. Also covers how engineering and technology management enables technological innovation.

Also offered as ETM 549 and may be taken only once for credit..

## ETM 650-Manufacturing Systems Engineering

 (4)Underlying concepts of manufacturing or production systems; product and process planning; job/flow shops; group technology, and flexible manufacturing cells.
Also offered as ETM 550 and may be taken only once for credit. . Prerequisite: graduate standing..

## ETM 651 - Manufacturing Sys tems 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, enterprise requirements planning, and concurrent engineering.
Also offered as ETM 551 and may be taken only once for credit. . Prerequisite: Background in manufacturing at the level of ETM 550/650 or equivalent, or consent of ins tructor..

## ETM 653 - Manufacturing Systems Simulation (4)

Introduction of discrete simulation techniques for the modeling of randomprocesses and probabilistic events in the simulation ofmanufacturing systems; concepts of systems modeling with emphasis on the use of an animated simulation package throughout the course.

Also offered as ETM 553 and may be taken only once for credit.. Prerequisite: graduate standing or consent of instructor, basic knowledge of probability and statistics..

## ETM 655 - Technology Marketing (4)

This course is designed to introduce students 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 analysis and positioning, and distribution strategies. Emphasis is placed on strategies for marketing technology products in industrial markets. Als op offered as ETM 555 and may be taken only once for credit.

Prerequisite: graduate standing or consent of instructor..

## ETM 656 - User-Centered Innovation (4)

Introduction to the various strengths and weaknesses of approaches to innovation. Focuses on a customerdriven methodology and introduces the increasingly prominent role of design in creating memorable experience, and emotional connection with a product and/or a company.
Also offered as ETM 556 and may be taken only once for credit..

ETM 659-Global Management of Technology (4)
Explores issues associated with the management of technology-driven industries in a globalsetting.

Strategic planning and management of technological innovation and commercialization are explored in selected countries, using processes in the US as benchmarks. A specific objective ofthis course is to explore ways to manage the developmentof competitive products or services, using projectteams focused on one or more countries.

Also offered as ETM 559 and may be taken only once for credit..

## ETM 660 - 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, term projects, and teamwork.
Also offered as ETM 560 and may be taken only once for credit. . Prerequisite: graduate standing or consentof instructor..

## ETM 661 - 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 business around technology that they develop, write a business plan and present their technology business idea to a financier.

Also offered as ETM 561 and may be taken only once for credit..

## ETM 662 - New Venture Management (4)

Explores actualemerging technologies that are likely to impact or create technology-based industries in the next 1-5 years, and gives a framework for identify ing, analyzing, acquiring, implementing and finally commercializing leading-edge technologies into new products or services.
Also offered as ETM 562 and may be taken only once for credit..

## ETM 663 - Intrepreneurshipin Technology (4)

The development ofnew products and services is fundamental to sustaining a long-term competitive advantage. The efforts of the individual or teamof entrepreneurs who are responsible 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.

Also offered as ETM 563 and may be taken only once for credit. . Prerequis ite: Graduate standing. Expected preparation:ETM 555/655 and ETM 535/635..

## ETM 665 -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. Statistical topics includea variety of statistical techniques 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 display of quantitative information.

Also offered as ETM 565 and may be taken only once for credit. .Prerequisite:Probability and statistics or consent of instructor..

## ETM 667 -Knowledge Management (4)

Introduction to some of the critical issues and debates in knowledge management. Stresses the human and businessaspects of knowledge management. Taught from the perspective of the user of technical tools and methods.

Also offered as ETM 567 and may be taken only once for credit..

## ETM 668 -Energy Technology Innovations (4)

Reviews managementoftechnology and innovation in the energy sector. Specifically, focuses on the technology developmenthighlighting the unique differences ofthe energy sector.
Also offered as ETM 568 and may be taken only once for credit. . Prerequisite: graduate standing.

## ETM 670 -Role of Government in Technology Management (4)

In their desire to grow theirnation'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.

Also offered as ETM 570 and may be taken only once for credit.

## ETM 671 - 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.

Also offered as ETM 571 and may be taken only once for credit..

## ETM 673 - 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. Unders tand 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.
Also offered as ETM 573 and may be taken only once for credit..

## ETM 675 -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 for economic development.

Also offered as ETM 575 and may be taken only once for credit. . Prerequisite: graduate standing..

## FILM - Film

## FILM 130 - Introduction to Digital Filmmaking

 for Non-Film Majors (4)A video production course for non-film-majors seeking a bas ic 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). There is no prerequisite for the course.

## FILM 131 -Film Analysis (4)

An introductory course in film analysis with special emphas is on cinema as a dramatic art and concepts related to the formal analys is offilm. 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 dis ciplines (liveaction, 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 analys is 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 C+ grade..

## FILM 257 -Narrative Film Production I (4)

An introductory study of writing, technical, aesthetic and organizational 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 content-related principles of digital filmmaking in nonfiction, documentary formats.

Prerequis ite:FILM 131 and and FILM 132, in which you must earn a minimum $\mathrm{C}+$ grade..

## FILM 280-Classical Film Theory (4)

Introduces the significanttrends 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 331U- 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 organizational 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. Fromterm to term, topics might include: Visual Effects; 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 content-related principles of igital filmmaking in nonfiction, documentary formats.
Prerequisite:FILM 258.

## FILM 362 -Documentary Film Production III (4)

An advanced study of aesthetic, technical, and content-related principles ofdigital 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 fordeploying 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
his torical, spatial, and social situations and strugg les 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 nonfiction film and video applications. The technical aspects and aesthetic considerations of storytelling through sound in lectures, screenings, demonstrations, exercises, creative projects, and class critiques will be assessed. 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 themwith 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: pre-production visualization, methods for shooting coverage, principles of composition, employing 2D and 3D space, the moving camera, us ing available light, production lighting techniques, how focal length impacts the shot, controlling depth of field, and managing exposure.
Prerequisite: FILM 131 and FILM 132, in which you must earn a minimum C+ grade; FILM 257 or FILM 258 .

## FILM 370U-Topics in Film, Media, and Culture (4)

Study of a variety of cultural and historical is sues 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 for credit 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 ofs ound; how the influences of a broad range of finematic art movements, including Expressionism, Impressionism, Surrealismand Poetic Realism, contributed to the classical Hollywood style. Also examines the artistic, economic and technological forces that led to the Hollywood studio systemand 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 $\mathrm{C}+$ grade. Sophomore standing recommended.. Corequisite: FILM 381L.

FILM 381L-Lab for Film 381 (0)
Lab for Film 381.
Corequis ite: 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 expression within the parameters of the classical 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 $\mathrm{C}+$ grade. Sophomore standing recommended.. Corequisite: FILM 382L.
FILM 382L-Lab for Film 382 (0)
Lab for Film 382.
Corequisite: FILM 382.

## FILM 383 - Film History III (4)

A study of contemporary world film production from the struggles of an independent and avantgarde cinema to the CGI effects oftoday's blockbuster. Also examines 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, artistic movements, and his torical 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 (112)

(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 investigate their interests, values, personality, andskills 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 pers onal 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 from the 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, sophis ticated short film in a chosen genre. Students manage all aspects of production and generate marketing materials and a dis tribution plan for the finished film. In addition to producing their own work, students are required to crew on fellow classmates' projects and therefore exit the course with high quality assets to add to a reelor portfolio.

Prerequisite: EitherFILM 359 orFILM 362..

## FILM 460 - Advanced Topics in Production (4)

Advanced study of a variety of specialized skills and/orgenres related to digital film production. From term to term, topics might include: MassiveMedia; Visual Effects; Music Videos; Web Cinema; Urban Media. Course may be repeated for credit with different topics.
Prerequisite: EitherFILM 362, FILM 359 or permission fromthe instructor..

## FILM 480 -Contemporary Film Theory (4)

A survey offilm theory and criticismfrom the 1960s to the presentday. Students are introduced to key concepts and major figures fromStructuralism, Semiotics, Psychoanalysis, Feminism, and Narrative Theory.

Prerequisite:FILM 131, FILM 132, FILM 280 and juniorstanding 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, thestar system, and historic context and meaning of films, independentcinema practices.

Prerequisite:FILM 131 and and FILM 132, in which you must earn a minimum 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; forexample, '70's Film \& TV Renais sance, Irish Cinema, and/or Robert Altman.

Prerequisite: 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 consider the cinema in relation to: national context and cinematic history; other national/transnational cinemas; and independence and nationalism, censorship, 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 mustearn 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, real estate ownership, financial institutions, consumers' credit, social security, stock market, mutual funds, and estate planning from the individual's point of view. Optional pass/nopass.

## Fin 301 U- Introduction to Investing (4)

Investing is a means to help you meet specific financial goals, such as retirement, purchasing a house, orstarting your own business. This class will introduceyou to investing and help you understand the types of investment options available, their ris ks 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 investment options 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 aspects of developing, financing, planning, managing, valuing and assessing new business ventures. Equips students with thequantitative, 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 as set pricing, capital budgeting, capital structure, dividend policy, working capital management, growth through mergers, and leasing. Emphas is on the development of problems olving capabilities.

Prerequisite: BA 303..

## Fin 352 - Investments (4)

Analytical study of the principles of investment in stocks, bonds, and other security ins truments. Includes background study of financial markets and institutions; analysis of the investment
characteristics, 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 interest rates, and security valuation.

Prerequis ite: 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.)
Prerequis ite: 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 professional activities away from campus.

Prerequis ite: consent of instructor..
Fin 410 - Selected Topics (1-4)
(Credit to be arranged.) Consent of instructor.

## Fin 419 - Financial Data Analytics \& Modeling (4)

Applies analytical tools to analyze big dataaround financial is sues faced by analysts, corporate managers, fundmanagers, 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 ofCSR 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 financial decision-making process of a firm. Emphas is on financial markets and the aggregate economy, how these financial institutions measure and manage the unique risks to which they are exposed and the governing rules and regulations of financial markets and institutions that govern how risk is transferred.
Prerequisite: BA 303.

## Fin 439 - Real Estate Valuation I (4)

Fundamentals of appraising real estate, focusing on valuation techniques for income-producing real estate assets. Analysis of income and expenses, net operating income, leveraged and unleveraged cash flows, debt coverage ratios, direct capitalization, multipliers, and discounted cash flows. Marketability analys is, highest and best use concepts, zoning, environmental issues, and the risks and rewards of real es tate development are dis cussed.

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. Financial 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 exch ange markets, exchange risk, and international diversification.

Also offered as graduate-level credit as Fin 556S and may be taken only once for credit. . Prerequisite: Fin 319, Actg 381..

## 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 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 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 Ass essment (2)

This course is a continuation of Fin 573. Students will continue the responsibility of managing a realdollar 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 as pect of this course. This is thesecond course in a two-class course sequence. Offered winter, spring, and summerterms.

Also offered for graduate-level credit as Fin 574 and may be taken only once forcredit. . 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 bus iness operation and business management to be studied by the individual and dis cussed 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 professional activities away fromcampus.
Prerequisite: consent of instructor..

## Fin 510 -Selected Topics (1-4)

(Credit to be arranged.) Consent of instructor.

## Fin 510S -SelectedStudies (1-4)

(Credit to be arranged.)

## Fin 513 - Financial Management (4)

Examines financial concepts and problemsolving skills required to evaluate whether managerial decisions add value to the firm. Students will develop an understanding of financial implications of businessdecisions and a framework with which to evaluate their decisions. Ethical standards and long term value creation are integrated throughout the course.

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 the relationships between inflation, interest and unemploymentrates. Building fromeconomic 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 therole of the director, shareholder rights, executive compensation, and the challenge of balancing the needs ofshareholders, 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 Caps tone Project (2)

Course provides an opportunity to apply business knowledge to a comprehensive finance 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 therole financial institutions play in financial markets, the structure of institutions and how they facilitate economic growth through the trans fer of capital. The course then analyzes how institutions measure 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 issues 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 analysis.

## Fin 540S - Real Estate Valuation II (4)

Principles of valuation applied in the context of real estate investments. Financial streng th analysis, cash flow estimation, determining the cost of capital, various discounted cash flow methods. Option
valuation and realoptions approaches. Relative valuation approaches. A pplied to the valuation of Real Es tate Investment Trusts and other real estate development entities.
Prerequisite: Fin 333, Fin 319..

## Fin 545 -Hedging and Risk Management (4)

Futures, options, swaps, and other derivative instruments, their characteristics, their uses in financial risk management, and their effects in speculativesituations; methodologies for valuation of derivatives. Exotic options, innovations in exotic derivatives and in the development anduse of derivatives in corporate finance and investments. The rapid development of derivatives in domestic and internationalfinance.

Prerequisite:Fin 513 or Fin 551..

## Fin 551 -Financial Management for Financial Analysts (4)

Gateway course to the Master of Science in financial analys is. 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 business interrelate and the supporting role that finance provides. Topics cons idered include cash flow analysis, risk determination, valuation, working capital management, and financing. Graduate credit cannot be earned for bothFin 513 and Fin 551.

Prerequisite: admis sion to the MasterofScience in Finance program.

## Fin 552 - Investments (4)

Analytical study of the principles of investment in stocks, bonds, and other security ins truments. Includes background study of financial markets and institutions; analysis of the investment characteristics, valuation, and market price behavior of bonds, stocks, and derivative securities, and the choice of appropriate portfolios of theses ecurities. 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 ins truments. Includes background study of financial markets and institutions; analysis of the investment characteristics, valuation, and market price behavior
of bonds, stocks, and derivativesecurities, and the choice of appropriate portfolios of thesesecurities. 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 and Analysis (4)

Valuation and Analysis extends the financial accounting and corporate finance topics introduced in the core graduate accounting and finance courses, and uses those topics to further the understanding how to value a business or investment. This is a practical and applied course that connects accounting and business analysis with finance issues into a systematic and process-driven approach forvaluation of both public and private firms. The courseuses a blend of lectures, discussions, cases and projects to learn the valuation process. Topics covered include financial statement analysis, business strategy and forecasting, due diligence, dis counted cash flow analys is and public versus private firmissues.
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, uniquerisks and relation to traditional investments. Types of as sets covered may include: real estate, private equity, venture capital, hedge funds, dis tressed securities and commodities.

Prerequisite: Fin 552 or approval of the instructor..

## Fin 555 - Applied Econometrics for Financial Analysis (4)

Theory and application of empirical methods, including model development, experimental design, and statistical analysis, applied to issues 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, investment and financing decisions of a firm in an international environment; foreign exchange markets, exchange risk, and internationaldiversification.

Prerequisite: BA 303, Actg 381 for Fin 456; Fin 551 or Fin 513 for Fin 556..

## Fin 556S - International Financial Management (4)

Developmentand 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 exch hange 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 as set pricing, capital budgeting, capital structure, dividend policy, working capital management, growth through mergers, and leasing. Emphas is is placed on the further development of problemsolving capabilities.

Prerequisite:Fin 551 or Fin 513..

## Fin 565-Corporate Financial Strategies (4)

This course extends the corporate finance topics introduced in the coregraduate finance course and aims to deepenunderstanding of the strategic issues and techniques associated with financial decision making. The perspective is that of the CFO of a corporation but also considers other stakeholders. Topics may include risk management, capital budgeting, financing decisions for established and entrepreneurial firms, special topics in firm valuation, working capital, and determination of the cost of capital. This course serves as background for other finance elective courses and builds skills in key financial principles. We emphasize economic underpinnings and application is sues through extensive applied case analysis using spreadsheet and risk-based tools.
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 valuationtechniques in security investment decisions. Students in this course serve as portfolio managers to a real dollar portfolio, providing security and sectoroversight 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 forFin 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 realdollar 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 thesecond 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 599 - Real Estate Finance and Investment (3)
Application of finance and economic principles to analys is of realestate finance and investments. Emphasis on the development of problemsolving capabilities through the use of computer application programs. Special attention is give to risk analysis, alternative mortgage instruments, hedging techniques, and thetaxeffects of realestate 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 ways 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 assignments, discussions, videos, slides and out of class performances, showings and exhibitions. Students will engage in the practice ofmaking 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 freedomfor discovery, this course will also offer a focused perspective to streng then 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 session includes practical application of a variety of creative techniques, including artistic, expressive and interd is ciplinary strategies; explorations in mind/body connection; sensory and visualization exercises; and activities whichutilize multiple intelligences. Intellectual understanding emerges from both theory and historical context, but will be developed primarily through a regime of selfunderstanding and activity.

## FPA 399 - Special Studies (1-8)

(Credit to be arranged.)

## FPA 445 - Senior Project (4)

Focuses on thebody of coursework undertaken in the BA/BS Arts Studies curriculumin an original creative work or comparable experience. This work may take the formof a performance, (with the student as creator/producer and/or performer), or a written thes is, 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 lis tening comprehension and oral practice, including the elements of grammar, vocabulary building, and elementary readings. This is thesecond 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 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 Fr 101, 102, 103.

## Fr 199 -Special Studies (1-12)

(Credit to be arranged.)

## Fr 201 -Second-Year French Term 1 (4)

Intensive review of basic materials introduced in First-Year French and further development of communication skills. This is the first course in a sequence of 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 First-Year 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)

Intensive review of basic materials introduced in First-Year 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 assignments. This is the first course in a sequence of three: Fr 301, Fr 302, and Fr 303. Expected preparation: Fr203.

## 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 assignments. This is the second course in a sequence of three: Fr 301, Fr 302, and Fr 303. Expected preparation: Fr203.

## 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: Fr203.

## 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 res earch 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 respectto each other and as influenced by morphological and syntactic factors (phonology). Expected preparation: Fr 301 or Fr 302.

## Fr 326 - French Convers ation (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 developmentof French life, thought, and arts of different periods, from the 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 Fr 341U, 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)

Focus ing on cultural, political, and social realities, this course introduces students to literature from France from the Middle A ges and the Renaissance. Readings include poetry, theater, and prose from representative 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 342U- Literature and Culture of the Seventeenth- and Eighteenth-Centuries (4)

Focusing on cultural, political, and social realities, this course introduces students to literature from France from the seventeenth and eighteenth centuries. Readings include theater, prose, and poetry from representative 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 343U-Literature and Culture 19th and 20th (4)

Focusing on cultural, political, and social realities, this course introduces students to literature from France from the nineteenth and twentieth centuries. Readings include poetry, theater, and prose from representative 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 outside of France. Readings include poetry, theater, and prose from representative 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.

Prerequisite: Fr 203.
Fr 399 -Special Studies (1-8)
(Credit to be arranged.)

Fr 401 - Res earch (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 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..

## Fr 412 - Creative Writing in French (4)

Stylistic and grammatical elements of several written genres will be analyzed in terms of why certain linguistic devices are used in particulargenres 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 Fr301, Fr 302, Fr 303 sequence..

## Fr 414 - Advanced French Grammar (4)

A systematic approach to the study of French grammar and syntaxformajors and prospective teachers.

Also offered for graduate-level credit as Fr 514 and may be taken only once forcredit. . Prerequisite: Fr 303.

## Fr 415 - Business French (4)

Advanced work in the language ofbusiness and economics. Recommended prerequisite: Fr 303.

## Fr 417 - Translation (4)

Special problems of translating between French and English based on a variety oftexts, both literary and non-literary. Expected preparation: Fr 303.
Also offered for graduate-level credit as Fr 517 and may be taken only once forcredit. .

## Fr 419-Medieval French Literature (4)

Selected works of Old French literature (reading in modern French translation). Expected preparation: at least 8 credits fromFr 341, 342, 343.

Also offered for graduate-level credit as Fr 519 and may be taken only once forcredit. .

## Fr 420 - Renaiss ance French Literature (4)

Selected works of literature representative of the French Renais sance. Expected preparation: at least 8 credits fromFr 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 frommajorclassicalwriters fromthe era of Louis XIV. Expected preparation: at least 8 credits from Fr 341, Fr 342, orFr 343.

Also offered for graduate-level credit as Fr 521 and may be taken only once forcredit. .

## Fr 423 - Eighteenth-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 forcredit. .

## Fr 427 - Nineteenth-century French Literature (4)

Selected works of prose, poetry, and drama from the 19th century writers. Expected preparation: at least 8 credits fromFr 341 , 342 , or 343.
Also offered for graduate-level credit as Fr 527 and may be taken only once forcredit. .

Fr 428 - Nineteenth-century French Literature (4)
Selected works of prose, poetry, and drama from the 19th century writers. Recommended prerequis ites: 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 forcredit. .

## 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 20 th Century (4)

Readings in 20th century literature of French expression fromoutsidemetropolitanFrance: i.e., Africa, Quebec, and the Caribbean. Expected preparation: at least 8 credits fromFr 341, Fr 342, or Fr 343.
Also offered for graduate-level credit as Fr 535 and may be taken only once for credit. .

## Fr 441 U- Major Works In Translation (4)

Study of texts representative of major French authors, periods, themes orgenres in translation: such topics as Classical drama, Realism, contemporary novel, Flaubert, and Camus. Readings, lectures, and discussions in English. Expected preparation: 4 credits of upper divis ion literature.
Also offered for graduate-level credit as Fr 541 and may be taken only once forcredit. .

## Fr 445 - Representations of War in French

 Cinema (4)Explores representations of WWI, WWII and the Algerian War in French films. Combines methods of film analys is 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 forcredit.. 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 forcredit. .

## Fr 494 - French Linguistics (4)

Introduction to the basic concepts of linguistics and their application to the French language. Emphasis on practical analysis of the sound and the grammatical systems. Brief survey of the his torical development, followed by an analysis of the phonetics, phonemics, morphology, and syntax of modern French.
Conducted in English. Recommended prerequisites: Fr 303, 325.

## Fr 497 - Applied French Linguistics (4)

A practicalapplication of linguistics to modern French. Emphas is on a contrastive analysis 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..

## Fr 512 - Creative Writing in French (4)

Stylistic and grammaticalelements of several written genres will be analyzed in terms of why certain linguistic devices are used in particulargenres 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, Fr 302, Fr 303 sequence..

## Fr 514 - Advanced French Grammar (4)

A systematic approach to thestudy of French grammar and syntaxfor majors and prospective teachers.

Also offered as undergraduate-level credit as Fr 414 and may be taken only once for credit. .

## Fr 515 - Business French (4)

Advanced work in the language of business and economics. Recommended prerequisite: Fr 303 .

## Fr 517 - Translation (4)

Special problems of translating between French and English based on a variety of texts, both literary and non-literary.
Also offered for undergraduate-level credit as Fr 417 and may be taken only once for credit. .

## Fr 519-Medieval French Literature (4)

Selected works of Old French literature (reading in modern French translation).

Also offered for undergraduate-level credit as Fr 419 and may be taken only once for credit. .

## Fr 520 - Renaiss ance French Literature (4)

Selected works of literature representative of the French Renais sance.

Also offered for undergraduate-level credit as Fr 420 and may be taken only once for credit. .

## Fr 521 -Seventeenth-century French Literature (4)

Readings frommajor classicalwriters fromthe era of Louis XIV.
Also offered for undergraduate-level credit 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-level credit 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 from the 19th century writers .

Also offered for undergraduate-level credit 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 prerequis ites: at least 8 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, Fr 342, or Fr 343.

Fr 535 - Francophone Literature of the 20th Century (4)
Readings in 20th century literature of French expression fromoutside 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. .

## Fr 541 - Major Works In Translation (4)

Study oftexts representative of major French authors, periods, themes or genres in translation: such topics as Classicaldrama, Realism, contemporary novel, Flaubert, and Camus. Readings, lectures, and discussions in English.

Also offered for undergraduate-level credit as Fr 441 U and may be taken only once for credit. .

Fr 542 -Medieval Works in Translation (4)
Study oftexts fromthe French middle ages. Readings, lectures, and discussions in English. Expected preparation: 4 credits ofupper division literature.

## Fr 545 - Representations of War in French Cinema (4)

Explores representations of WWI, WWII and the Algerian War in French films. Combines methods of film analys is and historical inquiry to understand nuances of representations of everyday life during conflicts -methods and skills that students will learn and apply throughout thequarter. 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 ofFrench poetry. Analysis of formand content.

## Fr 552 - French Drama (4)

Critical study of representative works of French drama.

## Fr 553 - French Prose (4)

Study ofrepresentative 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-level credit 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 analysis of the sound and the grammatical systems. Brief survey of the his torical development, followed by an analysis of thephonetics, phonemics, morphology, and syntax of modern French.
Conducted in English. Recommended prerequisites: Fr 303, 325.

## Fr 597 - Applied French Linguistics (4)

A practicalapplication of linguistics to modern French. Emphas is on a contrastive analysis 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 exercis es 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 or res earch 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 ofdeep time, the relationship between geology and topography, plate tectonics, volcanism, earthquakes, magnetis m , rocks and minerals, mountain building, basin formation. This is the first course in a sequence of two: G 201 and G202.

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 ofstreams,
glaciers, wind, and ocean waves and currents. Embedded in thesetopics is the discussion ofhuman practices impacting the natural environment. This is the second course in a sequenceoftwo: G201 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: G201, G 202. Requires concurrent enrollment 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 G201, 202, respectively, is required.

Corequisite: G201.

## G 205-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. Concurrentenrollment in G201, 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 throughtime. Lab exercises stress the studies of fossils. Concurrent enrollment in G 203 required.

Corequisite: G203.

## G 207-Computer Based Geology 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. Concurrentenrollment in G 202 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, classification, 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 generalchemistry. Corequisite: G312.. Corequisite: G312.

## G 314-Petrology (3)

Origin, classification, and distribution of igneous, metamorphic, and sedimentary rocks. Composition of the Earth's crust and mantle. Emphasis on rock type assemblages and theirgenesis occurring at major plate tectonic environments as represented by active/passive continental margins, rift zones, ocean basins and trenches, ocean is lands, continentcontinent collis ion 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 micros cope. Understanding textures and fabrics of rocks and what physical and chemical parameters control themsuch as crystallization and nucleation rate, compositional environment, stress field, and provenance characteristics.

Prerequisite: G312, G 313. Corequisite: G314.. Corequisite: G314.

## G 318 -Proces ses in the Surface Environment (3)

Physical processes occurring in the upper crust including tectonic provenances, weathering, mass transport, fluid-sediment transport, depositional environments, stratigraphic sequences, and intrastratal diagenesis.

Prerequisite: G201/204 and G 202/205. Co-requisite: G319.. Corequisite: G319.

## G 318L-Lab for G 318 (0)

Lab for G 318.
Corequisite: G318.
G 319 - Proces ses 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 using 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 biogeochemistry froman earth his tory perspective. Study of the orig in and evolution of Earth and its biogeochemical cycles; survey of the microbial and chemical reactions that occur within the atmosphere, litho sphere, 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 yearofchemistry.. Corequisite: G 322L.

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 hardware 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 providebackground in evolutionary concepts and to addresscurrent 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 fromthe 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.

Prerequis ite: upper-division standing..

## G 342U- Volcanoes and Earthquakes (4)

A study of volcanoes and earthquakes as they affect humans and the development of landscapes.
Prerequisite: upperdivision standing.
Prerequisite: Upper-division standing..

## G 344U- Geology and the National Parks (4)

Covers the geology that one finds in our nationalpark system. Parks will be grouped by similar geology. Basic concepts of geology will first be covered in each group and then each park of the group discussed.

Prerequisite: upperdivision 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 extrasolar planets, and the philosophical and societal implications of searching for life beyond Earth.
Prerequis ite: upper division standing. Two lectures, one 2-hour laboratory.. Corequisite: G345L.

## G 346-Exploring Mars <br> (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: G201.

## G 351 - Introduction to Oceanography (4)

A survey course designed to give students a broad general background. Emphasis is on interrelationships of ocean ography and other sciences. Useful for general studies, teachers and environmental 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 ocean ography and other sciences. Useful for general studies, teachers and environmental science majors.
Prerequisite: upper-division standing..

## G 352U- Minerals in World Affairs (4)

The geologic origin and occurrence ofmetals, fuels, and industrial minerals and rocks; their geographic distribution and relative abundance or lack among nations; the rules and principles which influence their past, present, and future exploration, development, and use.

Prerequisite: Upper division standing..

## G 353 - Natural History of Dinosaurs (4)

Dinosaurs, their evolution, classification, ecology and extinction in the context of changing environments. Study of the geologic record and tools used by geologists to determine geologic ages and sequences. Mechanisms of global change ranging fromplate tectonics to asteroid impacts.

## G 355-Earth and Space Sciences for Elementary Educators (4)

A survey of Earth and Space Scienceconcepts for students interested in elementary education. Des igned around "three-dimensional learning" 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 landformprocesses at the earth's surface including the work of water, wind, and ice in erosion, transportation, 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: G 374L. 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.

Prerequis ite: Successful completion of 401 (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.

## G410U-SelectedTopics (4)

(Credit to be arranged.)

## G 420 - Applied Geophysics (4)

Principles of geophysical measurement and interpretation; seis mology, gravimetry, isostasy, geomagnetism, terrestrial electricity. Includes a survey of geophysical exploration techniques. Three lectures, one 2-hour lab.

Also offered for graduate-level credit as G 520 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 ofdata 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 forcredit. . 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 referencedatum, digitizing, raster and vector operations, spatial statistics. Class projects apply data management and analysis techniques to the natural sciences. Weekly professionalquality lab reports are required. GIS tutorial followed by a gateway exam is used to demonstrate mastery of introductory material.
Also offered for graduate-level credit as G 524 and may be taken only once forcredit. . 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 display offield-based data for the natural sciences. Geospatial datagenerated using field-based technologies (i.e. GPS) are converted into appropriate database structures (i.e. GIS) for analys is 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 fromthe study offossils and the sedimentary rocks in which they occur. Includes integrated laboratory and field experience.
Prerequisite: upper division standing. Two lectures, one 2-hour laboratory (academic year) or field studies (summer).

## G 434-Structural Geology and Tectonics (5)

Study oforigin, 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: G 434L.

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, infersea-level changes, and understand a basin's tectonic evolution. Two lectures, two 2-hour laboratories and required field study.

Prerequisite: G318 and G 314.. Corequisite: G 435L.

## G 435L-Lab for G 435 (0)

Lab for G 435 .
Corequisite: G435.

## G 436-Sens ors and Ins trumentation (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., G 324/G 326, G 523).

Also offered for graduate-level credit as G 536 and may be taken only once forcredit.. 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 analys is, and granulometry. Two lectures; two 2-hour laboratory periods.

Prerequisite: G312, one year ofgeneral physics, radiation safety certification (acceptable as a corequisite).. Corequisite: G437L.
G 437L-Analytical Methods Lab (0)
Lab for G 437.
Corequisite: G437.

## G 438 -S canning Electron Micros copy in the Sciences (4)

Theory and practice of scanning electron microscopy and elemental analysis, including beaminteractions, signal detection, image and spectrumformation, sample preparation, and data analysis. Student teams pursueoriginal research projects using natural or manufactured specimens provided by science faculty. Graduate students are encouraged to explore thesisrelated projects.
Also offered for graduate-level credit as G 538 and may be taken only once for credit. . Prerequisite: introductory course sequence in geology, biology, chemistry, physics, environmental science or engineering. .

## 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 forcredit. . Prerequisite: G 312 or one year of generalchemistry..

## 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 75-minute 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: G 314.. Corequisite: G440L.

G 440L-Volcanology Lab (0)
Lab for G 440.
Corequisite: G440.

## G 442 -Igneous Petrogenesis (4)

Investigation into theorigin and evolution of magmas and igneous rock suites using geochemical and petrographic methods, differentiation of theEarth throughtime, 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: G 314.. 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 ofnew water bodies and rejuvenation of depleted and starved aquifers.

Also offered for graduate-level credit as G 543 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 geochemistry. Emphas is on dis tribution 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. . Prerequis ite: G 314..

## 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 system chronology, pre-solar grains, abiotic synthesis of organic matter, differentiation, impacts and collisional processes, and meteorites fromMars. Three lectures.
Also offered for graduate-level credit as G 546 and may be taken only once for credit. . Prerequisite: G 201, 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 sedimentyield, transport, and deposition in terres trial 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 geochemistry 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, one 2-hour laboratory.
Also offered for graduate-level credit as G 548 and may be taken only once forcredit.. Prerequisite: Ch 221 and Ch 222. Corequisite: G 448L.
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 Space Science concepts for students interested in middle and high school education. Course is designed around "threedimensional learning": how to engage content through practices and recognition of themes, following Oregon ScienceStandards.
Also offered for graduate-level credit as G 550 and may be taken only once for credit. . Prerequisite: 24 credits ofmathematics and/or science courses..

## G 453-Geology of the Pacific Northwest (4)

Survey of the topographic and geologic features of the Pacific Northwest, including mining his tory and focusing on theclose relationship of the region as the leading edge of moving continental plate.
Prerequisite: upper division standing. .

## G 454 - Cas cade Volcanoes (1)

Field course in the study of one or more Cascade volcanoes-origin and development of volcano, eruptive mechanism, deposits, rock types, and hazards. Course may be repeated fordifferent 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 forcredit. . Prerequisite: upperdivision standing and one prior course fromthe following: G 201, G 202 ..

## G 455-Environmental Coastal Geomorphology

 (4)Introduction to coastal processes, geomorphology, habitat, and development is sues: emphasis on coastal shelf, beach, estuarine and dune systems. Includes the influence of sea-level, tides, waves, wind, and development pressures on these coastal systems.
Also offered for graduate-level credit as G 555 and may be taken only once forcredit. . Prerequisite: G 351 U 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 significant component of the course is hands-on geologic field investigations and as tronomical observations (summer) or 2-hour laboratory (academic year).

Also offered for graduate-level credit as G 556 and may be taken only once forcredit. . Prerequisite: upperdivis ion standing.. Corequisite: G 456L.
G 456L-Lab for G 456 (0)
Lab for G 456.
Corequisite: G456.

## G 458-Astrobiology (4)

Astrobiology focuses on is sues surrounding the origin and evolution of life on Earth, the environmental conditions required for life els ewhere, 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 G 558 and may be taken only once forcredit.. Prerequisite: G 322 or upperdivision standing in life, environmental, or physicalscience.

## 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 useofthat 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) thatset the 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 forcredit. . Prerequisite: upper divisionstanding in a phys ical or life science program. Corequisite: G459L.

## G 459L-Quaternary Climate Lab (0)

Lab for G 459 .
Corequisite: G459.

## G 460-Soil Geomorphology (4)

Effects of climate, vegetation, parent material, topography, andtime on the development, weathering, classification, and chemistry of soils. Two 75 -minute lectures and one 2 -hour laboratory.
Also offered for graduate-level credit as G 560 and may be taken only once forcredit.. Prerequisite: G 201, 202, Ch 200- level(1 year).
G 460L-Soil Geomorphology Lab (0)
Lab for 460 .

## G 461-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 resources, environmental law related to geology, medical geology, climatic change. Two 75minute lectures and one 2-hour laboratory.

Also offered for graduate-level credit as G561 and may be taken only once forcredit. .Prerequisite: general chemistry (1 year), G 201, 202.. Corequisite: G 461L.

## G 461L-Environmental Geology Lab (0)

Lab for 461 .
Corequisite: G461.

## G 462 -Hillslope Materials and Processes (4)

This class examines thephysical, biological, and chemical processes that convert fresh bedrock into mobile regolith and transport materials onhillslopes. Topics include sediment budgets, hills lope hydrology, weathering, soil production and transport, mass movements, landslides, and landscape evolution.

Also offered for graduate-level credit as G562 and may only be taken once forcredit.. Prerequis ite: (G 318 or Geog 320 or ESM 320), and (Ph 201 orPh 211 or EAS 211) and Mth 251. Corequisite: G 462L.

## G 462L-Lab for G 462 )

Lab for G 462 .
Corequisite: G462.

## G 464 - The Cryosphere (4)

Investigation ofthe global cry osphere-theregions 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. Emphasis is placed on modern systems and climate change. Lecture and lab. Lab work uses modern observational data and state-of-the-art climate simulation tools.

Prerequisite:upper-division or graduate standing..

## G 464L-The Cryos phere Lab (0)

Lab for the Cryosphere.

## G465-Glacial Geomorphology (4)

The investigation of the importance of glaciers to landscape modification and global environmental change via an understanding of their formation, structure, mas and energy exch ange, and movement. Erosion and deposition processes will also be examined. This class adopts the process perspective whereby understanding the physical processes provides significant insightinto therelative importance of the controlling mechanisms of change. Field trip is required.
Also offered for graduate-level credit as G 565 and may be taken only once forcredit. . Prerequisite: introductory geology, physicalgeography, or geomorphology course..

## G 466-Glaciology (4)

The physics ofglacier 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 G 566 and may be taken only once for credit. . Prerequisite: one year of calculus and one year of physics..
Corequisite: G466L.
G 466L-Lab for G 466 (0)
Lab for G 466.
Corequisite: G466.

## G 470 -Engineering Geology (4)

Applications ofgeological information to engineering problems:soilmechanics, rock mechanics, construction materials, groundwater and construction, instrumentation, exploration, terrain models, lands lide analysis. Three hours of lecture and two hours oflab per week. Labs stress quantitative analys is. 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: G 202, Ph 203.. Corequisite: G470L.

G 470L-Lab for G 470 (0)
Lab for G 470.
Corequisite: G470.

## G 474L-Geomorphic Processes Lab (0)

Lab for G 474.
Corequisite: G474.

## G 475-Introduction to Seis mology and Site Evaluation (4)

Earthquakes and exploration seismology, the orig in and occurrence of earthquakes, nature and propagation of seismic waves in the earth, earthquakes as a hazard to life and property. Uses of reflection and refraction exploration seis mology, borehole velocity measurements, seismic remote sensing, and direct measurement techniques. Earthquake hazard assessment 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 for credit.

Also offered for graduate-level credit as G 575 and may be taken only once forcredit.. 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 seismology) to evaluate the earthquake cycle. The course will cover subdisciplines within earthquake geology and skills neces sary to conducta geological investigation of earthquakes. The class will evaluate the four tectonic environments; transform, extensional, subduction, and continental collision. Field trips required.
Also offered for graduate level credit as G576 and may be taken only once for credit.. Prerequis ite: G 318. Corequisite: G476L.

## G 476L-Lab for G 476 (0)

Lab for G 476 .

## G 477-Earthquake 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 seehow 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 eng ineering, structural engineering, and architecture. This course is the same as CE 448 and may be taken only once for credit.

Also offered for graduate-level credit as G 577 and may be taken only once forcredit.. Prerequis ite: G $475 / 575$ or CE 443/543..

## G 480 - Basin Analysis (4)

An integrated look at sedimentary basins and their formation. Sedimentary basins contain valuable resources (water, geothermal, fossil fuels ) and record tectonic processes. Basin geometries will be described through hands-on exercis es using well log, potential fields, and seismic data. These will be used to constrain mountain building, paleoclimate, and mantle processes.

Also offered for graduate-level credit as G 580 and may be taken only once forcredit.. Prerequis ite: 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 G 581 and may be taken only once for credit. . Prerequisite: G 485..

## G 484 - Field Geophysics (4)

Applications ofgeophysical techniques to solving a field problem. Methods applied may includegravity, res istivity, 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 G 584 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, Global Positioning System, and aerial photographs, preparation of reports and maps. Two lectures and one 4-hour laboratory. One-week field exercise at end of term.

Prerequisite: G434 and G 435.. Corequisite: 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 forcredit. . 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 and one 2-hour laboratory.
Prerequisite: Mth 254, Ph 213 , and G326..

## 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 -S electedTopics (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, isostasy, 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. . Corequis ite: 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 ofdata 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 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 professional quality lab reports are required. GIS tutorial followed by a gateway exam is used to demonstrate mastery of introductory material.

Also offered for undergraduate-level credit 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 display of field-based data for the natural sciences. Geos patial datagenerated using field-based technologies (i.e. GPS) are converted into appropriate database structures (i.e. GIS) for analys is and reporting. Project design and implementation are developed in cooperation with the instructor. Integrated laboratory/field experience.
Also offered for undergraduate-level credit as G425 and may be taken only once for credit. .

## G 536-Sensors and Ins trumentation (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., G 324/G 326, G 523).
Also offered for undergraduate-level credit 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 analysis, differential thermal analys is, and granulometry. Two lectures; two 2-hour laboratory periods.

Prerequisite:G312, one year of general physics, radiation safety certification (acceptable as a corequisite).. Corequis ite: G 537L.

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 elementalanalysis, including beaminteractions, signal detection, image and spectrum formation, sample preparation, and data analysis. Student teams pursueoriginal research projects using natural or manufactured specimens provided by science faculty. Graduate students are encouraged to explore thesisrelated projects.
Also offered for undergraduate-level credit as G438 and may be taken only once for credit. . Prerequisite: introductory course sequence in geology, biology, chemistry, physics, environmental science or engineering..

## G 539 - Powder X-ray Diffraction (2)

Identifies and quantifies minerals usingpowder Xray 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 foruse 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 75-minute 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: G 540L.

## G 540L-Volcanology Lab (0)

Lab for G 540.
Corequisite: G540.

## G 542 -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 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 andeffect 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-level credit as G443 and may be taken only once for credit. .

## G 544 -Well Dynamics (4)

Study of the interactions of waterwells and an aquifer system, including all types of aquifer systems and pump tes ts to analyze those systems, well drilling and design, pump selection, and groundwater explorations.
Prerequisite: G443..

## G 545-Geochemistry (4)

A survey of geochemistry. Emphas is on dis tribution of elements in the Earth, nuclear geochemistry and thermodynamics of geologic systems.

Also offered for undergraduate-level credit 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 system chronology, pre-solar grains, abiotic synthesis of organic matter, differentiation, impacts and collisional processes, and meteorites fromMars. Three lectures.

Also offered for undergraduate-level credit as G446 and may be taken only once for credit. .

## G 547-Environmental Sediment Transport (4)

Study of sediment transport, bedforms, and depositional environment, with focus on quantitative methods of predicting rates ofsediment yield, transport, and deposition in terrestrial and marine environments.

Also offered for undergraduate-level credit 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 ofboth inorganic and organic 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 Science concepts for students interested in middle and high school education. Course is designed around "threedimensional 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-Cascade Volcanoes (1)

Field course in the study ofone or more Cascade volcanoes-origin and development of volcano, eruptive mechanism, deposits, rock types, 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 developmentissues: emphasis on coastal shelf, beach, estuarine and dune systems. Includes the influence of sea-level, 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-ongeologic 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 558-Astrobiology (4)

Astrobiology focuses on is sues surrounding the origin and evolution oflife on Earth, the environmental conditions required for life elsewhere, and the potential forlife on other planets and satellites in our solar system. Additional topics include the discovery, occurrence, and habitability of extrasolar planets, and the philosophical and societal implications ofsearching for life beyondearth.
Also offered for undergraduate-level credit 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 interglacialcycles; the useof that record to develop conceptual models of paleoclimate interactions among land, ocean, atmo sphere, and biosphere; and geologic changes during the Cenozoic (the last 65 million years) that set the stage for the Quaternary. Includes computer laboratory exercises using paleoclimate data.

Also offered for undergraduate-level credit 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 ofclimate, vegetation, parent material, topography, and time on the development, weathering, classification, and chemistry of soils. Two 75 -minute lectures and one 2-hour laboratory.

Also offered for undergraduate-level credit 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 geologicalenvironment, water supply, mineral and energy resources, environmental law related to geology, medical geology, climatic change. Two 75minute lectures and one 2 -hour laboratory.

Also offered for undergraduate-level credit as G461 and may be taken only once for credit. . Corequisite: G 561L.

## 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 thatconvert fresh bedrock into mobile regolith and transport materials onhillslopes. 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.. Corequis ite: G 562L.

## G 562L-Lab for G 562 ()

Lab for G 562.
Corequisite: G562.

## G 564 - The Cryosphere (4)

Investigation of the global cryosphere-theregions 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. Emphasis is placed on modern systems and climate change. Lecture and lab. Lab workuses modern observational data and 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 inves tigation of the importance of glaciers to landscape modification and global environmental change via an understanding 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-level credit as G465 and may be taken only once for credit. .

## G566-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 forstudents 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. . Corequisite: 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. Three hours of lecture and two
hours oflab per week. Labs stress quantitative analysis. One day field trip explores landslides of the Portland area.

Also offered for undergraduate-level credit as G470 and may be taken only once for credit. . Corequisite: G 570L.

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 Proces ses 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 ofseismic waves in the earth, earthquakes as a hazard to life and property. Uses of reflection and refraction exploration seis mology, borehole velocity measurements, seismic remote sensing, and direct measurementtechniques. Earthquake hazard assessment 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 forcredit.

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 oftools (e.g. geomorphology, stratigraphy, structure, geophysics, and seismology) to evaluate the earthquake cycle. The course will cover subdisciplines within earthquake geology and skills neces sary to conduct a geological investigation of
earthquakes. The class will evaluate the four tectonic environments; transform, extensional, subduction, and continental collision. 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 assessment for a project in the design process. The goal of this course is to allow geologists, geotechnical engineers, structural engineers, and architects to seehow their particular tasks are impacted by theearthquake effects. Types of analysis used to evaluate earthquake design requirements in the severaldisciplines including geology, geotechnical engineering, structural engineering, and architecture. This is the same course as CE 548 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: G 475/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 exercis es using well log, potential fields, and seismic data. These will be used to constrain mountain building, paleoclimate, and mantle processes.

Also offered for undergraduate-level credit 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-level credit as G481 and may be taken only once for credit. . Prerequisite: G 485..

## G 584 -Field Geophysics (4)

Applications ofgeophysical techniques to solving a field problem. Methods applied may includegravity, res istivity, 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-level credit as G484 and may be taken only once for credit. .

## G 591 -Physical Processes in Geology (4)

Application ofmechanics to physical processes in geology, such as igneous intrusion, rock folding, debris flow, lava flow, groundwater, and glaciation.
Also offered for undergraduate-level credit 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 physicals tratigraphy including seis mic, 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 from finite strain, rock fracture, and rock folding. May be repeated if topics are different.
Also offered for credit as G695. . Prerequisite: G 491/591, 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 -Diss ertation (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.)

## G607-Seminar (1-9)

See department for course description. (Credit to be arranged.)

## G 609-Practicum(1-9)

(Credit to be arranged.)

## G 610 -Selected Topics (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 ofemplacement. Advanced techniques in analysis and examination. May be repeated if topics are different. Two lectures and one 2-hour laboratory.
Prerequisite: G542..

## G 618 -Clay Mineralogy (4)

Clay structure and classification, clay mineral analys es including X-ray identification and differential thermal analys is, mixed-layer clays, claywater systems, clay mineral-organic reactions, engineering properties related to clay materials, geological occurrence ofclays. Major emphasis on engineering problems related to clays and the field occurrence ofclays.

Prerequis ite: radiation safety certification..

## G 619 - Topics in Geochemistry (4)

Topics in the application of geochemistry to solve geological problems. Advanced techniques in analys is and examination. Two lectures and one 2hour laboratory. May be repeated iftopics are different.

Prerequisite: G545..

## G 650 - Res earch 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 use scientific literature, understand the development of scientific argument, and communicate research ideas through writing and presentation.

Prerequis ite: Graduate standing..

## G 651 - Res earch 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 personal 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 seis mic, sequence, geochemical, paleomagnetic, well log, and topics in Quaternary process stratigraphy.
Also offered for credit as G592 and may be taken only once for credit. . Prerequisite: G 434..

## G 695 - Topics in Geomechanics (4)

Topics chosen from finite strain, rock fracture, and rock folding. May be repeated iftopics are different.

Also offered for credit as G595. . Prerequisite: G 491/591, 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 theenvironment in which people live. The focus is on natural processes that create physical
diversity on the earth. Major topics are weather and climate, vegetation and soils, landforms, ecosystems, their distribution and significance.

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 fromhuman activities (such as population growth, transportation systems, urban structure, economic development, resource use and management, and the evolution of political patterns) are considered in a global context. Case studies from several world regions illus trate the processes by which humans modify their world to create distinctive cultural landscapes.

## Geog 299 -Special Studies (1-4)

(Credit to be arranged.)

## Geog 310U-Climate and Water Res ources (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 ScienceInquiry. Also listed as Sci333; course may be taken only once for credit.

Cross-Listedas: Sci333U.

## 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 from ice 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 everyday life. Includes laboratory and/or fieldwork.

Cross-Listed as: Also offered as Sci334U and may be taken only once for credit..

## Geog 313U- Biogeography (4)

This course examines current and his torical distributions of organisms 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 organisms at local to globalscales. 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 cons equences ofglobal climate changeon the intensity and location of severe weather phenomena. Recommended prerequisite: Geog 210.

## Geog 320 - Geomorphic Processes (4)

Study of landformprocesses at theearth's surface including the work of water, wind, and ice in erosion, transportation, and deposition on land and sea. The significance ofgeomorphic 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 G374; course may be taken only once for credit. Expected preparation: Geog 210 and Mth 111.

Corequisite: Geog 320L. Cross-Listed as: G374.
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 shape Mt . Hood and investigates some of the is sues that arise when a mostly wild mountain abuts an urban area. Class involves 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 special emphasis on the alpine environmentof 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 urb an 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: upperdivisionstanding.

## 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 pres sure and winds, air masses and fronts, and hurricanes and tornados. This course is the same as Ph 333 ; course may be taken only once forcredit. Recommended: upperdivision standing or Geog 210.

Cross-Listedas: Ph 333U.

## Geog 340U- Global Water Issues and Sus tainability (4)

Examines the availability and quality offreshwater 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 res ource management. Focuses on case studies in major international rivers.

## Geog 345U- Res ource Management (4)

Survey of natural res ources, their occurrence, and their management. Primary focus will be on the United States, with case studies from other countries and regions. Recommended prerequis ite: 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 present and potential adjustments to thesesituations. Recommended prerequisite: upper division standing.

## Geog 347U - Environmental Iss ues and Action (4)

Examines environmentalismas a phenomenon reflecting cultural appraisals of nature and society's relationship to it. Explores the history and ideology of the environmental movement, and investigates 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 culturaladaptation and environmentalchange froman ecological perspective, focusing on biomes, cultural adaptations within themand the political structures that influence cultural adaptations. Particular attention to traditional societies and the impacts of development.
Recommended prerequis ite: upper-division standing.

## Geog 349U- Mountain Geography (4)

Investigates mountain environments as distinctive biophysical and cultural realms. 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 spotsin light of long-standing political-geographical rivalries, including ethnic group rivalries, economic disparities, and conflicting historical claims. Particular emphas is will be placed on political organization of territory, nationalism, boundary conflicts, colonialism, and, where relevant, metropolitan political fragmentation. Recommended prerequisite: upperdivision standing.

## Geog 351U- Pacific Northwest(4)

Study of the Pacific Northwestas a region ofthe United States. Overview of the region and its relationship to other parts of the world will be followed by an analysis of the physical environment, natural resources, agriculture, manufacturing, transportation, population, and urban development. Special attention will be paid to theoretical developments in contemporary regional geography issues. Recommended prerequisite: upperdivision 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 notonly 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 comprehensivelook at the events and people shaping the last 150 years of Asia-Pacific history and relates themto Pacific Basin relationships today. Reveals how, fromthe 19th century onward, modern nations haveemerged fromthe 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: upperdivision standing.

## Geog 354U- Europe (4)

Focuses on thechangingeconomic and political geography of Europe, post World War II, and the adjustments to changing world conditions. Analysis of the geo graphic conditions of individual countries. Examines theirpopulation, 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 thathave 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, theenvironment, and the debt crisis on the lands and lives of everyday people in the region. Recommended prerequis ite: upper division standing.

## Geog 363U- Geography of sub-Saharan Africa (4)

A survey course on thephysical 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 ofthe physicaland cultural landscapes of southwestern A sia 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 from the initial period of European exploration and colonization to the present. Topic include the acquisition of geographicalknowledge; cultural transfer and acculturation; westward expansion; res ource exploitation; regional and national integration; and landscape change. Recommended prerequisite:upperdivision 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
distinctive regions; 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 include his torical, cultural, and contemporary usage ofmaps, the power of maps and critical cartography, participatory mapping and mentalmaps, 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 meas urement 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 - Vis ualization of Spatial Data (4)

The use of graphic modes for visualizing data as a fundamental tool in geography and other disciplines. Topics include graphic types, bar charts, line graphs, pie graphs, time series, flow charts, organizational charts, scales of measurement, datatransformations, and indexnumbers. 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 - Res earch (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 ins tructor.

## Geog 404 -Cooperative Education/Internship (012)

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 -SelectedTopics (0-6)

See department for course description. (Credit to be arranged.)

Geog 412 - Global Climate Change Science and Socio-environmental 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 integrated models for climate change impact assessment.
Also offered for graduate-levelcredit as Geog 512 and may be taken only once for credit. . Prerequis ite: Senior or graduatestanding in Geography..

Geog 413 -Disturbance Biogeography of Pacific Northwest (4)
Dis turbances are important natural components of all ecosystems, 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, lands lides, earthquakes, and floods among others. The course includes at leastonemandatory 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 res ource management and environmentalanalysis: precipitation, runoff processes, evapotranspiration, soilwater, 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 soilto landforms, vegetation, and ecological development. Major emphasis is givento 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 -Lands cape Ecology (4)
Examines the structure, function, and changeof 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 res earch and sampling
design, field measurements and mapping, data analys is and report writing and the use of field equipment. Field and lab exercis es 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 ofupper 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 photography supplemented by data collection from census records, taxrecords, historic maps and photographs, and published accounts about places. Expected preparation: 8 credits of upper division or regional geography or graduate standing.
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, 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 have changed overtime, 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 Lands capes (4)

Analysis of the contemporary built environment of metropolitan areas; social, cultural, political, and economic forces that have given cities their formand 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 Environmental Science Management and Geography. This class focuses on the complex challenges of managing wildfire in integrated social and ecological systems (SESs) and uses the wes tern US as case study to focus on the biophysical and social sciencebehind 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: Upper-divis ion standing.. Corequisite: None. CrossListed 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 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. 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 - Res ource Management Topics (4)

Focuses on advanced topics in administration and management of natural resources. Reviews historical is sues and today's struggles for a sustainable approach in the development of natural resource policy. Emphas is will vary, e.g. water resources, energy 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 once forcredit. . Prerequisite: upper-division standing..

## Geog 446 - Water Resource Management (4)

Analysis of the distribution, useand management of water resources, emphasizing the systems of water rights, legis lation, and regulations which govern water resources. Issues 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 resource management 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 issues associated with human dimensions of streams in the urban environment. Topics include the role of streams in the built environment, human modifications ofstreamsystems and their consequences (e.g., dis appearing streams, channelization), and local community responses to restore and protect urban streams. Case studies are drawn from national 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, spatialstructure of the urban forest, management and regulation ofurban trees, and techniques for evaluating the health of the urban forest and 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 cuis ines 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 forcredit. . Prerequisite: Upper-division or graduate standing..

## Geog 462 -Sense of Place (4)

Places are created by people, infused with meaning, and tied to personal 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, global-local tensions, territoriality, and contested places.

Also offered for graduate-level credit as Geog 562 and may be taken only once forcredit..

## 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, agritourism, lands cape stewardship, urban design, and alternative energy production. Examines international transferability of sustainability concepts. Expected preparation: junior/senior or graduate class standing; relevant experience; permission of instructor.
Also offered for graduate-level credit as Geog 565 and may be taken only once for credit. .

## Geog 467 -Community Resilience in Coupled Socio-Ecological 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 thequestions 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. Investigates 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 accessibility 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 geospatial 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 \& Vis ualization

 (2)Introduction to the theory and methods of the analys is 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: Upper-division standing..

## Geog 477 - 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 graduate-level credit as Geog 577 and may be taken only once for credit.. Prerequisite: Upper-divis ion standing.

## Geog 480 - Remote Sensing and Image Analys is (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 graduate-level credit as Geog 580 and may be taken only once for credit. . Prerequis ite: Geog 380U.

## Geog 481 -Digital Image Analysis I: Introduction

 (4)Interpretation and meas urement from digital satellite imagery used for interpretation of the earth's surface. Analysis willbe largely based on the application of computertechnology 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 measuring land use/land cover change, and advanced algorithms for digital image analysis. Includes computer exercis es 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. . Prerequis ite: Geog 481..

## Geog 484 -Cartographic Applications of GIS (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. . Prerequis ite: Geog 380U..

## Geog 485-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 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 spatial analysis techniques. Students will use GIS software to complete a series of computer lab exercis es that demonstrate a variety of approaches to the analysis 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 graduate-level credit as Geog 588 and may be taken only once for credit. . Prerequisite: Geog 380U 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 (

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 nonspatial 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 analys is. Topics include GIS software environment, programming syntaxand styles, interface customization, 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 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 for credit.

Also offered for graduate-level credit as Geog 592 and may be taken only once for credit. . Prerequisite: Geog 488 or USP 591.. Corequisite: Geog 492L. Cross-Listed as: USP 592.

Geog 492L-GIS II Lab (0)
Lab for G 492.

## Geog 494 - GIS for Water Res ources (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 datarepresentation and analysis in GIS, and issues 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 ofs patialdata, emphasizing environmentalquestions within the framework of the raster data model. Topics include an introduction to general systems theory, thenature of models, cartographic model development, model implementation procedures, map algebra, vectortoraster data conversion, guidelines forsymbol us age, 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 fundamentaltechniques for the analys is of spatial and non-spatial data as applied to geographic problemscenarios. 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 analysis, spatialautocorrelation, spatial interpolation, and multivariate spatial data analysis.

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.) Consentof instructor.

## Geog $\mathbf{5 0 2}$-Independent Study (1-9)

(Credit to be arranged.)

## Geog 503-Thesis (0-9)

See department for course description. (Credit to be arranged) Consentof instructor.

## Geog 504 -Cooperative Education/Interns hip (09)

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 instructor.

## 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 and Socio-environmental 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 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)

Disturbances are important naturalcomponents of all ecosystems, including those in the Pacific Northwest. Disturbances also present risks to human society, yet these are difficult to assess, 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, lands lides, earthquakes, and floods among others. The course includes at leastonemandatory 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 res ource management and environmental analysis: precipitation, runoff processes, evapotranspiration, soilwater, 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 soil to man. Examines the importance of soilto landforms, vegetation, and ecological development. Major emphasis 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-level credit 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 s cale 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.. CrossListed 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 analys is 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 the history of geographic thought and literature. Thesecond 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 organizing and writing reports. Required of all graduatestudents in geography.

## Geog 523-Geographic Res earch 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 from census records, taxrecords, his toric maps and photographs, and publis hed accounts about places.
Also offered for undergraduate-level credit 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 have changed overtime, current theoretical developments, and how this
subfield of geography fits into the discipline. Includes field work project.
Also offered for undergraduate-level credit 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 thathave given cities their formand image; historical processes of urban development; and messages and meanings ofour 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 Environmental Science 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 sciencebehind 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.. CrossListed 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 urbanecology and greencity 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 localeconomies. 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 for credit.

## Geog 545-Resource Management Topics (4)

Focuses on advanced topics in adminis tration and management ofnatural resources. Reviews historical is sues and today's struggles for a sustainable approach in the development of natural res ource
policy. Emphas is will vary, e.g. water resources, energy 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, legis lation, and regulations which govern water resources. Issues 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 resource management schemes.

Also offered for undergraduate-level credit as Geog 446 and may be taken only once for credit. .

## Geog 547-Urban Streams (4)

Investigates issues 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., dis ap pearing streams, channelization), and local community responses to restore and protecturb an streams. Case studies are drawn from national 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, spatialstructure of the urban forest, management and regulation of urban trees, and techniques for evaluating the health of the urban forestand 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 mes sages 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, global-local tensions, territoriality, and contested places.
Also offered for undergraduate-level credit 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, agritourism, lands cape stewardship, urban design, and alternative energy production. Examines international transferability of sustainability concepts.
Also offered for undergraduate-level credit as Geog 465 and may be taken only once for credit. .

## Geog 567 -Community Resilience in Coupled Socio-Ecological Sys tems (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 thequestions 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.. CrossListed as: This course is the same as EMCR 567 and may be taken only once forcredit..

## 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. Investigates 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 ofGIS practice as well as the accessibility of GIS data and tools to all.

Also offered for undergraduate-level credit as Geog 472 and may be taken only once for credit.. Prerequis ite: Geog 588 or equivalent.

## Geog 574-Methods and Models in Socioecological 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 from multiple disciplines to analyze socioecological systems across biophysical, social, economic, and cultural contexts. Provides an interdis ciplinary 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 ofnew digital geospatial 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. . Prerequisite: Geog $488 / 588$, prior or concurrent enrollment in Geog 492/592..

## Geog 576 -3D Terrain Analys is \& Visualization

 (2)Introduction to the theory and methods of the analys is 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 ofdigital 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 from remotely 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-level credit 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-level credit 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 forgeographic information extraction, digital change detection methods formeasuring 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 undergraduate-level credit as Geog 482 and may be taken only once for credit. . Prerequisite: Geog 481/581..
Geog 584-Cartographic Applications of GIS (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 in to effective maps both forprint and the web, and how to critique maps.
Also offered for undergraduate-level credit 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 specialemphasis 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. .

Prerequis ite: 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, the nature of geographic data, databases, data collection, mapmaking, and spatial analysis techniques. Students will use GIS software to complete a series of computer lab exercises that demonstrate a variety of approaches to the analysis 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 5588.

## Geog 589 - Building a GIS Database with GPS (4)

Develops knowledgeand skills necessary to usethe global positioning systems (GPS) to collect, process, and use geographic data. GPS theory and techniques through field survey experiences. Collect and integrate spatial and nonspatial 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 analys is. Topics include GIS software environment, programming syntaxand styles, interface customization, 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 -Professionalism in GIS (2)

Students meet in a seminar format to learn from each other, from faculty members, from community partners, and fromother experts and practitioners in the field of Geographic Information System. Presentations, dialogue, and case exploration will offer learning aboutcurrent 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 dimens ions of GIS as a career path.

Prerequisite: 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 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 for credit.
Also offered for undergraduate-level credit as Geog 492 and may be taken only once for credit.
Prerequisite: Geog 488/588 or USP 591.. Corequis ite: Geog 592L. Cross-Listed as: USP 592.
Geog 592L-GIS II Lab (0)
Lab for 592.

## Geog $\mathbf{5 9 4}$-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 datarepresentation and analysis in GIS, and issues in the applications of GIS for watershed management.
Also offered for undergraduate-level credit as Geog 494 and may be taken only once for credit.

## Geog 595 -Maps, Models, and GIS (4)

Analysis and dis play of spatial data, emphasizing environmental questions within the frame work of the raster data model. Topics include an introduction to general systems theory, thenature of models, cartographic model development, model implementation procedures, map algebra, vectortoraster data conversion, guidelines for symbol usage, and the incorporation of digital remote sensing data into map models. Expected preparation Geog 485/585.
Also offered for undergraduate-level credit 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 analys is of spatial and non-spatial data as applied to geograph ic problemscenarios. 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 includepoint pattern analysis, spatialautocorrelation, spatial interpolation, and multivariate spatial dataanalysis.
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 -Res earch (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 $\mathbf{6 0 5}$-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 Socioecological Systems (4)

Evaluates changing socioecological systems in a holistic way, drawing multiple disciplines, including ecology, economics, eng ineering, and geographical and spatial sciences. Introduces methods and models from multiple disciplines to analyze socioecological systems 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 574 and may be taken only once for credit..

## Ger-Germanic Languages

Ger 101 - First-Year German Term 1 (4)
Beginning German. Emphas is 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. Emphas is on communication skills: listening, speaking, reading, writing. This is the second course in a sequence of 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 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: Ger 201, Ger 202, and Ger 203. Expected preparation: Ger 103.

Ger 202 -Second-Year German Term2 (4)
Intensive review ofbasics 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 aspects. Development of skills in different modes of communication as appropriate in business settings. Hands-on 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 historical 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 ofGerman literature. Lectures and discussion on German prosody, genres, fundamentals of literary analysis and criticism. Expected preparation: Ger 203.

Ger 341 U- Introduction to German Literature (4)
Readings fromrepresentative German authors from the 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 from the 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 - Res earch (1-9)
(Credit to be arranged.)

Ger 404 - Cooperative Education/Internship (112)
(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 410U-SelectedTopics (4)

(Credit to be arranged.)

## Ger 411 - Advanced German (4)

Special features of German; selected writing and reading assignments, 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 forcredit. .

## 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 forcredit. .
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 forcredit. .

## 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 ofGerman-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. Hands-on 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 from Ger 340, Ger 341, or Ger 342.

## Ger 427 - The Age of Goethe (4)

Study of German poetry, drama, and prose fromthe Sturm und Drang and Classicism to 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 forcredit .

## 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 from Ger 340, Ger 341, or Ger 342.

Also offered for graduate-level credit as Ger 528 and may be taken only once for credit. .

## 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 fromGer 340 , Ger 341, or Ger 342.

Also offered for graduate-level credit as Ger 529 and may be taken only once forcredit. .

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 theend 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 forcredit. .

## Ger 441 U- Major Works in Translation (4)

Study of selections frommasterpieces ofGerman literature in trans lation, such as Goethe, the W eimar 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 forcredit..

Ger 442 U- Medieval Works In Translation (4)
Study oftexts 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 aspects of fictional and nonfictional writings within the context of the cultural and philosophical history of modern Germany.
Also offered for graduate-level credit as Ger 584 and may be taken only once forcredit..

## 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 forcredit. .

## Ger 497 - Applied German Linguistics (4)

A practicalapplication oflinguistic 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 forcredit. .
Ger 501 - Res earch (1-9)
(Credit to be arranged.)

Ger 503 - Thesis (1-9)
(Credit to be arranged.)

Ger 504 - Cooperative Education/Internship (112)
(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 -SelectedTopics (1-12)

(Credit to be arranged.)

## Ger 511 - Advanced German (4)

Special features of German; selected writing and reading as signments, dis cussion. 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, dis cussion. 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)
Structural review 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 prose of 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 ofGerman poetry, drama, and prose from the Sturm und Drang and Classicism to 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 Realism and Naturalism (4)
Study of the poetry, drama, and prose of 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 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 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 ofthe 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 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, AncientMyth in German Literature. Readings, lectures, and discussions in English.

Also offered for undergraduate-level credit as Ger 441 and may be taken only once for credit. .
Ger 542-Medieval Works In Translation (4)
Study oftexts fromthe German Middle Ages. Readings, lectures, and discussions in English. Recommended prerequisite: 4 credits of upper division literature.

## Ger 551 -German Poetry (4)

Study of German lyric poetry. Analysis of formand content.

## Ger 552 -German Drama (4)

Critical study of representative works of German drama.

## Ger 553 -German Prose (4)

Study ofrepresentative works ofGerman 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 prerequisite: 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 philosophical history of modern Germany.

Also offered for undergraduate-level credit as Ger 484 and may be taken only once for credit..

Ger 590 - History of the German Language (4)
A generalhistorical survey showing the development of German grammar, word formation, vocabulary, and syntax with reference to the history 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-level credit 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 analy sis 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 sequence ofthree: 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 ofthree: 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 ofthree: 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 fromarchaic 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 sequenceof 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 ofhow the ancient Greeks sought to procure divine aid for communal or private benefit throughrituals and practices, such as prayers, sacrifices, mystery cults, and curse tablets, and the influence on later Roman religion. A full spectrum of 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 underly ing 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 ofhuman happiness, and the various strategies devised to cope with this seemingly unavoidable aspect ofhuman existence. Conducted in English.

## Grk 336U- Ancient Laughter: Ridicule and the Abs urd (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 mechanisms 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 422 -Critical Perspectives on Quantitative

 Analysis (4)Uses critical Indigenous, decolonizing, feminist and anti-racist 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; permis sion 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, vis ual and multimedia representations.

## GRN 520 - Critical and Decolonizing Research Methodologies (4)

This interdis ciplinary and multid is 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 anti-racist 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. Interdis ciplinary and intersectional focus and applications. Note: Not a methods course; does not teach statistical or quantitative methods.

Also offered for undergraduate-level credit as GRN 422 and may be taken only once for credit..
Prerequisite: Familiarity and experience with basic statistical and quantitative data and methods. CrossListed as:This is the same course as WS 522 and may be taken only once forcredit..

## GRN 530 -S ocial Justice Pedagogy (4)

Focus on contemporary radical pedagogical theories and practices. Students will analyze, experience and develop theirown social justice pedagogies. Students will examine radical theories of education andcocreate 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 ways of understanding the topical focus related to the reproduction and production ofsocial relations, domination and res istance.

## 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 from production 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 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 and overview of Enterprise Resource Planning (ERP) systems, their function in business, the major modules, and datastructures with an emphasis on supply chain and accounting issues.
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 data structures 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 ofbusiness..

## GSCM 429-Global trans portation and Logistics management (4)

Overview of global logistics including transportation, warehouse location and layout, inventory policies, distribution operations, information systems, and import tariffs.

Prerequisite: BA 301, BA 303, and BA 339.

## GSCM 432 - Craft Beverage Operations

 Management (4)An overv iew of the craft brewery business from grower to glass. Covers processes and as sociated costs for making and selling craft beverages fromraw materials to production, distribution, and retail environments. Students will complete a bas ic businessplan.

Also offered for graduate-level credit as GSCM 532 and GSCM 532S 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 301, BA 303, and BA 339.
GSCM 440 - Governmental Procurement (4)
Introduction to theories and practices of governmentalprocurement. Major aspects of purchasing within public agencies in the United States with special emphasis on the Oregonstatutes and adminis trative 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 org anizational 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 and evaluate the validity ofeach.

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 orGSCM 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 trans portation; facility location and transportation network design; role of wholesalers and distributors in the food supply chain; food safety; food industry consolidation and globalization; supply chain compres sion; 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-in-time.

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) <br> Overview of planning strategies and tactical execution forsustainable 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.

## GSCM 512 -Global Managerial and Cost

 Accounting (4)The coursecovers global managerial costaccounting is sues, and focuses on the use of accounting information with in 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 analys is, and inventory valuation.

## GSCM 513 - Principles of Strategic Global Logistics (4)

This course deals with the developmentofstrategies supply chain management involving the transfer of goods and services across national bound aries. 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 transportation.

## GSCM 514-Reverse Logistics and ClosedLoop Supply Chain (4)

The increas ing globalization of suppliers and customers has increased concern with the issues of sustainable and responsible management across global supply chains. In this coursestudents will explore the main risks, opportunities and practices we now see in global supply chain management from both conceptual and practical perspectives on sustainable practice. Students in this course will engage in applied studies and learn fromacademics and practitioners about the current challenges in this critical business arena.

## GSCM 515 - Global Case Studies in Supply Chain Management (4)

The final course in the Supply and Logistics Specialization integrates all of the concepts contained within the previous three classes. GlobalSupply 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 managerial decisions.

## 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 performan in-depth analys is of integrated operations management systems with emphasis on operations planning and
control, material requirements planning, master scheduling, forecasting, capacity planning, just-intime 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 must coordinate 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 S upply 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 spectrumof project management in supply chain includes theparticipation 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, ande-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, dynamic markets, and globalization are impacting supply chain strategies and practices, including: logistics, inventory and risk management, procurementand supply contracting, product and process design, and revenuechannels.

## GSCM 521 -Global Information, Systems and Data Analytics (4)

The premise of this course is that supply chain management mustunderstand and assess the information res ources 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 act upon 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 from four perspectives: the virtual teamleading across borders and org anizations, ethical and cultural ramifications of leadership, and the ethicaltraits 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 behalfofthe client.

## GSCM 532 -Craft Beverage Operations Management (4)

An overview of the craft brewery business from grower to glass. Covers processes and as sociated costs for making and selling craft beverages fromraw materials to production, distribution, and retail environments. Students will complete a bas ic businessplan.
Also offered for undergraduate-level credits as GSCM 432 and may be taken only once forcredit. . Cross-Listedas: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 as sociated
costs formaking and selling craft beverages from raw materials to production, dis tribution, and retail environments. Students will complete a basic businessplan
Also offered for undergraduate-level credit as GSCM 432 and may be taken only once for credit. . Prerequisite:BA 339. Cross-Listed as: 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 wholesalers 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 undergraduate-level credit as GSCM 458 and may be taken only once for credit. . CrossListed 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 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 undergraduate-level credit as GSCM 458 and may be taken only once for credit. . Prerequisite: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-in-time.

Also offered for undergraduate-level credit as GSCM 459 and may be taken only once for credit. . CrossListed 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 and just-in-time.

Also offered for undergraduate-level credit as GSCM 459 and may be taken only once for credit. .
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 to explore 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 org anization'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.. CrossListed 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.. Prerequisite: 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: Admission into the program.

## GSCM 573 - New Product Introduction and Innovation (4)

Apply supply chain management thinking into new product design and innovation process.

Prerequis ite: Admis sion into the program.

## 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 sequenceof 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 prerequis ite: Heb 103. Fornon-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. Fornon-native speakers of Hebrew only. This is the second course in a sequence of three: Heb 201, 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 prerequis ite: Heb 103. Fornon-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 emphasizes modern media Hebrew. Translation and writing. Recommended prerequisite: Heb 203. Fornon-native speakers of Hebrew only. This is the first course in a sequence oftwo: 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. Trans lation and writing. Recommended prerequisite: Heb 203. Fornon-native speakers of Hebrew only. This is the second course in a sequenceof 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 Is rael as they are represented in Israeli graphic novels and graphic novels written about Is rael in the 2000s and 2010s.

## Heb 361 - Israel through Film (4)

Discusses the history and culture of Is rael as it is represented in Israelicinema 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/Interns hip (1-

 12)(Credit to be arranged.)

## Heb 410 - Selected Topics (1-6)

(Credit to be arranged.)

## Hon - University Honors Program <br> Hon 101 - The Global City (5)

This year-long sequence introduces ways to think critically about the urban environment and the interdependence between thecity and the global world. It begins thestudy of representations and perceptions of the city, the city in historical context, and the processes thatshape thecity's geopolitical manifestations. This is the first course in a sequence of three: Hon 101, Hon 102, and Hon 103.

Prerequisite: admis sion to Honors Program.

## Hon 102 - The Global City (5)

This year-longsequence introduces ways to think critically about the urban environment and the interdependence between thecity and the global world. It begins thestudy of representations and perceptions of the city, the city in historical context, and the processes thatshape thecity's geopolitical manifestations. This is the second course in a sequence of three: Hon 101, Hon 102, and Hon 103.
Prerequisite: admis sion 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 thecity and the global world. It begins thestudy of representations and perceptions of the city, the city in historical context,
and the processes that shape thecity'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 undergraduateresearch, 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 frimarily qualitative social science methodologies, such as ethnography and spatial/geographic analysis.
Prerequisite: admission 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 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)

Consentof 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 <br> HSMP 502 - Independent Study (1-12) <br> (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.)
Cross-Listed as: PAH 509.
HSMP 510 - SelectedStudies (1-6)
(Credit to be arranged.)

## HSMP 541 - Organizational Behavior in Health Service Organizations (3)

This course provides an overview oforganizational theory and behavior in health services organizations. The emphas is is on developing an understanding of the factors and forces that influence thestructures,
behaviors andoperations of various organizations that deliver health and related services. This understanding will be developed through consideration of organizations, their environments, 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 messaging are also addressed as a component of the marketing strategy.

## HSMP 543 -Culture and Health Care (3)

The course is designed to providean examination of health delivery andoutcomes 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 willbe achieved. This course is open to admitted students in the graduate programs in the Division of Public Administration and other appropriate graduate programs. This is the same course as PAH 543 and may be taken only once for credit.

Cross-Listedas:PAH543.

## HSMP 544 -Leaders hip 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 local health and human services leaders and their governance relationships. Students als o conduct self-assessments of present and future leadership practice and potential.

Prerequisite:HSMP 541, HSMP 571, and HSMP 574..

## HSMP 570-Health Administration (3)

An examination of issues 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 administration. 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 ealth 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 legis lation. 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 legis lation is examined in terms of historical analys is and the legis lative process, including the role of interestgroups, 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 issues 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 is sues, and assists students in addressing these is sues in the context of both personal and org anizational values and beliefs. Specific course content includes, but is not limited to, ethical issues such as reproductive issues, emerging diseases, product liability, pharmaceutical controls, advertis ing, occupational and environmental issues, 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 aspects of health services production and delivery which address the health needs of populations with respect to death, disease, dis ability, discomfort, and dissatis faction. Students will examine the interrelationships of systemstructures, 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 comparis ons used to illus trate 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 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 as HSMP 675 and may be taken only once for credit.. Prerequisite: HSMP 571..

## HSMP 576 - Strategic Management of Health Care Organizations (3)

This course enables students to define health services delivery problems and is sues, collect and analyze relevant information, and articulatesolutions to strategic management issues. Course content emphasizes organizational strategic planning tools and processes, including directional strategies, internal and external environmental assessments, 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 org anization.

Prerequisite:HSMP 541, HSMP 574, HSMP 587, HSMP 588 and completion of at least 30 credit hours in the MPH:HMP or MPA:HA programofstudy..

## HSMP 577 -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 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, organizational performance as sessment, 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 systems. 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 organizational needs and technology capabilities, and the management and control of IT resources in a variety ofhealth-related organizational settings.
Prerequisite: HSMP 574..

## HSMP 580 - Health Services Human Res ources Management (3)

Overview of human resources 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 evaluated from the health care employee and health care manager perspectives. 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: long-termdemographic trends (e.g., population aging, immigration, fertility); social and economic policies (including health policy); and characteristics of the healthcare system. Special
emphasis is placed on translating 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 Health 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 ealth 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 fromexperts. 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 disparities. Students will develop skills necessary to assess the empirical evidence for, and health implications of social policies in the areas ofeducation, 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 586 - 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 improveefficiency, 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 health care, theory of production and cost, measurement 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 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 resources 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 program evaluation in the health services system. Includes multiple methods anduses of evaluation from the perspectives of managers, health professionals, and health services researchers, with an emphasis on the utilization of evaluation findings in programplanning and management in health services. Course learning will be synthesized through a community-based learning experience involving working with a community partner to develop an evaluation framework and methodology for an existing or proposed health program.

## HSMP 589-Res earch 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.. Prerequisite: Bsta 525..

## HSMP 590-Global Health Program Evaluation \& 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 program evaluation. 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 -Diss ertation (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 organizations, the interaction of organizations and their environment, and the behavior of individuals within organizations. 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-disciplinary perspectives on current is sues 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 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 571 and may be taken only once for credit..

## HSMP 673 -Values and Ethics in Health (3)

This course addresses issues 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 is sues, 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 issues 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 organization, financing, and delivery of health services. The emphasis is on thesystemic aspects of health services production and delivery which address the health needs of populations with respect to death, disease, dis ability, discomfort, and dissatis faction. Students will examine the interrelationships of system 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 theUnited 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 international health 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 or HSMP 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.. Prerequisite: 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 healthcare system. Special emphasis is placed on translating 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 lessons learned for the development and implementation of ealth 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 fromexperts. 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 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 for graduate-level credit as HSMP 583..

## HSMP 684 -S ocial 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 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 improveefficiency, 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 health care, theory of production and cost, measurement 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 - Res earch 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 res earch process,
and will be competent in conducting critical appraisals 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 -History of Western Civilizations (4)
Survey of the origins and developmentofWestern civilizations from antiquity to the present. Hst 101: Antiquity to Renaissance; Hst 102: Late Medieval to Enlightenment; Hst 103: Enlightenment to present. This is the first course in a sequence of three: Hst 101, Hst 102, and Hst 103.

## Hst 102 -History of Western Civilizations (4)

Survey of the origins and developmentofWestern civilizations from antiquity to the present. Hst 101: Antiquity to Renaissance; Hst 102: Late Medieval to Enlightenment;Hst 103: Enlightenment to present. This is the second course in a sequenceof three: Hst 101, Hst 102, and Hst 103.

## Hst 103 -History of Western Civilizations (4)

Survey of the origins and developmentofWestern civilizations from antiquity to the present. Hst 101: Antiquity to Renaissance; Hst 102: Late Medieval to Enlightenment; Hst 103: Enlightenment to present. This is the third course in a sequence of three: Hst 101, Hst 102, and Hst 103.

## Hst 104 - Introduction to World History (4)

A survey of world his tory fromearliest times to the present, combining both chronological and thematic approaches. Hst 104: Origins to 1000 CE, Hst 105: 1000-1600 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 his tory fromearliest times to the present, combining both chronological and thematic approaches. Hst 104: Origins to 1000 CE, Hst 105: 1000-1600 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 his tory fromearliest times to the present, combining both chronological and thematic approaches. Hst 104: Origins to 1000 CE, Hst 105: 1000-1600 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 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 cultural his tory of the Ancient World, concentrating mainly on the Ancient Near East, Greece, and Rome.

## 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 his tory through the viewing and analysis of important documentaries and feature films. The subject matter will vary from term to term.

## Hst 300 -His torical Imagination (4)

The how and why of the his torian's craft:(1) an introduction to the basics of research and writing; (2) an examination of historical writing, its relationship to the time and place of its origin, and theemergence of the ideas, consciousness, and canons of scholarship which shaped it. This course serves as an introduction to the study of is tory at the upper division level and is recommended for students beginning their junioryear.

Hst 312U.

## Hst 309U- The Roman Republic (4)

A study of the political, social, economic, and culturalhistory 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 4 th century CE.

## Hst 311 - Introduction to the New Testament (4)

We will study the diverse writings of the New Testament as products of their original historical, 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 Chris tians. This course may be repeated once for credit.

Cross-Listedas: 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. Us ing a lecture/discussion 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 305 U and may be taken only once for credit. Expected preparation: Upperdivision standing.

Cross-Listedas: BSt 305U.

## Hst 313U-African History Since 1800 (4)

An upper division course designed to survey the history of the A frican continent from 1800 to the present, with emphasis 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 orupper division standing.
Cross-Listed as: BSt 306U.

## Hst 314U - Ancient Near East and Egypt (4)

Covers the Stone Age to the death of Alexander the Great in 323 BC, from Afghanistanto Egypt. Topics include the agricultural revolution, 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 his tory of the Greeks and their neighbors. From earliest beginnings through the Hellenistic age.

## Hst 316U- Roman History (4)

A study of the social, political, economic, and cultural his tory 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 the end of the first millennium CE primarily by means of close readings of primary sources. Describes the diverse forms of Jewish life under Persian, GrecoRoman, Early Christian and Muslimrule 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-Listed as: 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 modern 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, 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 NearEast. This is the same course as JSt 319 and may be taken only once for credit.
Cross-Listedas: JSt 319U.

## Hst 320U- East Asian Civilizations (4)

Origins and developmentof East Asian civilizations from the earliest human 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, Chos on 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 W ars in China and the Meiji Restoration in Japan, through postwarstate and society in Japan and the People's Republic ofChina. Some attention to Korea, Vietnam, and Taiwan. Emphasis on concepts of imperialism, Westernization, modernization, and revolution.

## Hst 323 -Modern Korea (4)

Korea's modern history is as complexas any national history, with colonization from 1905-1945 followed by the political division of the Koreannation 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 BlackPower 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, self-determination, discrimination, police/state violence, community control, and cross-racial/cross-ethnic organizing. These social movements are set with in a global context framed by the Vietnam War, AntiColonialism, 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/ahis tory 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 ChLa 325 and may be taken only once for credit.
Cross-Listed as: ChLa 325.

## Hst 326U-Chicano/a His tory, 1900-Present (4)

Mexican American/Chicano/ahis tory 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 for credit.

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 Cris is of the 1890s, the Purity Crusade, Corporate and Anticorporate Progressive Reform, World War I, 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, W arren G. Harding, Calvin Coolidge, and Herbert Hoover.

## Hst 328U- U.S. History, 1932-1960 (4)

A survey of political, social, cultural, and economic history covering the Great Depression of the 1930s, Noninterventionist Sentiment and World War II, Cold WarDomestic and International AntiCommunism, and the Early Civil Rights Movement. In doing so, the class addresses Franklin D.

Roosevelt's New Deal and the presidencies of Harry Truman and Dwight D. Eisenhower.

## Hst 329U - U.S. History, 1960-Present (4)

A survey of political, social, cultural, and economic history covering the Cold War and Vietnam, Sixties Civil Rights and Radical Activism, Watergate, the Rise of Populist Conservatism, the Emergence of the Global Economy, and Political Polarization. In doing so, the class addresses the presidencies of John F . 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 ofthe Eastern Woodlands 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 responded to the policy of the United States in the 19th and 20th centuries.

## Hst 331U - Native Americans of Western North America (4)

Explores the his tory of peoples native to Western North America in the American Southwest and Pacific Coast regions, and in British Columbia. Covers the period fromprecontact to the present and considers the responses fromnative nations to the repeopling 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 history 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-first century.

## Hst 334U - History of Canada (4)

Survey of the social, economic, and political history of Canada fromthe 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 thehis tory, 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 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. Particularattention 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 naturalresource economy, the Tom McCall 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 history 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 the experiences of and relationships among women of diverse origins, especially Native women, African women, and European women. Key themes include family, kinship, and sex-gender systems; colonialism and slavery; religious life; politics and the law; nation-building and the rise of modern citizenship.

## Hst 341 U- 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; colonialismand resistance; women's rights and social reform; education and wage labor; immigration/migration; and Victorianismand sexual modernism.

Hst 342 U- 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 1500 s 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 his torical 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 America Since WorldWar Two (4)

Surveys significantreligious, cultural, and political developments in American Jewry since the end of World War Two. Topics include the impact of the war and the Holocaust; liberalis $m$, radicalism, and neoconservatism; suburbia; the counterculture; the fading of immigrant memory; Jewish feminism; the orthodox revival; relations with African-Americans and other minority groups; and the relationship between American Jewry and the State of Is rael.

## 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' War. 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 thepre-
Revolutionary crises, the War 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 War 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 ofs lavery 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 ofthe war, the consequences of the conflict, and the reconstruction 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 Nativenations and the state and federalgovernments, 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 his tory of England from the conquest in 1066 through the English Civil Wars and the ensuing period when England was withoutits 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 351 U- English History from 1660 to the Present (4)

Designed to survey the history of England from the restoration of the monarchy in 1660 to the present time. Using a lecture/discussion format, explores significant events and developments in the governance, society, economy, and religion of England during this period.

## Hst 352 U- European Women's History to 1700 (4)

An upper-division course designed to survey the history of women and the changing social construction of gender in Europe fromc. 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 ofW estern Europe and the Mediterranean, including thedecline of Roman imperial might in Europe, the spread ofChristianity, the Islamic, 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 transformations. Subjects include the twelfth-century cultural "renaissance," the emergence of European states and the papal monarchy, the rise of religious dissentand persecution ofminorities, the trans formation ofmedieval spirituality, the Crusades, European expansion and external encounters, growth of cities and the university, and the late medieval bubonic plague pandemic.

## Hst 356U- Renaiss ance 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 sourcematerials. 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)

Major developments in European social, political, economic, cultural, and intellectual history fromthe late 16 th through the mid-19th centuries.

## Hst 358U-Europe from National Unification to European Union (4)

Major events (World W ars I and II), socio-political movements (communism, fascism, Nazism), people, and themes in European history from the mid-19th century to the present.

## Hst 359U- Early Modern France (4)

A survey of the history of France during the Reformation, the Age of Absolutism, 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 361 U- Modern France \& the World since 1815 (4) <br> Examines the France and its role in the world from 1815 to present, including revolutions, restorations, empire, world wars and national identity.

## Hst 362 U- 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 four centuries of the expansion and decline of the British Empire. Emphas is on the military, political and economic history of imperialism, 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 Int1364 and may only be taken once for credit.

## Hst 365U - History of Latin America, 4000 BCE1810 (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 resistances; 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, 1820Present (4)

Course examines: Independence, search for autonomous political purpose, European economic penetration, Hispanismo, colonialismand slavery, U.S. imperial outreach, regional revolutions, armies and nation building, the modelof "development", import substitution, Japanese emigration, artis tic revolutions, indigenism, world wars, Cold War, liberation theology, music, food, autonomous res is tance, role of labor, s atis fying wes tern needs (tourism, stimulants, individual and labor exploitation), megacities, missing the computer age, NAFTA vs. Chinese manufacturing, failing states, neo-authoritarianism, Covid-19.

## Hst $\mathbf{3 6 8}$-Brazil and Mexico in the 20th Century (4)

A comparative history of theserising 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 critical category 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 supranational agencies to contain it.

## Hst 375U - History of Kievan and Muscovite Russia, 800s-1700 (4)

Explores Kievan Rus and MuscoviteRussia. Emphasis on political change, social conflicts, and identity formation through the appanageperiod. 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 PostSoviet Russia (4)

Studies the Soviet Union fromits founding in 1917 to the early post-Soviet period. Emphasis on socialism as 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, philos ophy, asceticism, ritual, religious law, the image ofthe holy man and the phenomenon of religious polemic in the Later Roman Empire (c. 250600 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 history. Includes society and culture

Zionis mcreated 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 JSt 379U and can only be taken once for credit.

Cross-Listed as: JSt 379U.

## Hst 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"; resis tance 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 his tory. Topics include mystical visions in ancient Jewishtexts, medieval Kabbalah and the Zohar, the Sabbatean messianic movement, Hasidism, and contemporary uses of Kabbalah. This is the same course as JSt 381 U and may be taken only once for credit.

Cross-Listed as: JSt 381U.

## Hst 382U-Palestine and Is rael (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 prerequisite: upperdivision standing.

## Hst 383U- Modern Iraq and Syria (4)

A survey course examining the modern history of Iraq and Syria from the late nineteenth century to the present day, with the goal of providing his torical context for contemporary political, cultural, economic, and military conditions in both states.

## Hst 384U- Ottoman World (4)

An overview of Balkan and Middle Easternhistory from late-medieval to early modern times (c. 14th18 th centuries). Major themes include therise 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 imperialism, 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 Arab-Israeliconflict, Cold W ar, oil, and the rise of political Islam.

## 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, butglobal perspectives willalso be cons idered.

## Hst 390U- Topics in World History (4)

Provides an overview of a particular period and/or theme in world history. Students will focus on major trends and/or connections related to the specific topic. Coverage will be global in breadth. Acceptable for the World History minor.

## Hst 399 -Special Studies (1-12)

See department for course description. (Credit to be arranged.)

## Hst 401 - Res earch (0-6)

See department for course description. (Credit to be arranged.) Consent of instructor.

## 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 instructor.
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 his torical 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 history work. One lab course is required for graduatestudents taking the public his tory track in the M.A. in history.
Prerequisite: Hst 496/596..

## Hst 412 - Topics in African History and Culture

 (4)An in-depth exploration ofselected topics in African cultural history. Special attention will be given to thematic issues 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 Trans nationalis m(4)

Examines human activities, institutionalstructures, 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 nationstate. Frameworks for study include border zones, deterritorialized nations orpeoples, 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-levelcredit 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 Etrus cans to the Dark Ages. Topics will include social, political, economic, and intellectual 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-levelcredit 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 three courses with different topics.)
Also offered forgraduate-levelcredit 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, statesociety 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, 1945-present (4)

Selected themes in postwar Japanese history, including the Occupation reforms (1945-52) and Japan's place in the Cold Warsystem, the so-called "economic miracle," the development of a mass consumer culture, and U.S.-Japan relations.
(Maximum number of fredits 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 themesrelating to the family, urban and rural life, education and the like-in Chinese social history. The subject matter will vary fromterm to term. (Maximum numberofcredits 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 history related to Confucianism, Buddhism, Daoism, and other philosophical and religious constructs. 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 524. . Prerequisite:Upper-division standing..

## Hst 425 -Modern China (4)

History ofChina from decline ofimperial system through 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 culturalchanges, 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 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 underNazism, science and Modernism, Darwinism and socialDarwinism, 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 fredits 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 expression.

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 theEuropean legacy; Puritanism; race, class, and ethnicity; American Enlightenment and Revolution; CulturalNationalism; 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 forcredit. . Prerequisite: Upper-divis ion standing..

## Hst 431 - Rise of American Corporate Culture (4)

Relation of cultural attitudes and values to the American historical experience from 1860-1945. Topics include Civil War and Reconstruction; Incorporation, Labor Reform, and Utopian Thought; Populism; Progressive Reform; Two Cultures of the 1920s; Depression Realismand Radicalism; W orld 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: Upper-divis ion standing..

## Hst 432 - Recent U.S. Political Culture (4)

Relation of culturalattitudes 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, andFeminist 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: Upper-division standing.

## Hst 433 - American Social and Intellectual History, 1600-1865 (4)

Examines early history of American socialand intellectual history, including issues 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: Upper-divis ion standing..

## Hst 434 - U.S. Social and Intellectual History, 1865-present (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 once forcredit. . Prerequisite: Upper-divis ion standing..

## Hst 438 - American Economic History: the First Century (4)

The economic background of the War of Independence and the seeds of the Civil War. Industrialization, urbanization, and development of the frontier. Rise ofbig business and organized 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 forcredit. .

## Hst 439 - American Economic History: the 20th

 Century (4)Economic impact of U.S. involvement in World War I. Postwar structural changes. Waning of laissezfaire. Causes of the Great Depression. Economic policies of Hoover and Roosevelt adminis trations. TheNew Deal reforms. World War II and emergenceof the adminis tered system. Evolution of the mixed economy and growing role of the government. The industrial-military complexand the social imbalance. Expected preparation: Ec 201, 202.

Also offered for graduate-level credit as Hst 539 and may be taken only once forcredit. .

## Hst 440 - American Environmental History (4)

A survey of North American history that explores the relationships between ideas of nature, trans formations of the environment, and the effect of the environment onhumans. Topics include colonialism; links between ecological change and race, class, and gender relations; the role of science/technology; agriculture, industrialization, and urbanization; and environmentalism.

Also offered for graduate-level credit as Hst 540 and may be taken only once forcredit. . Prerequisite: upper-division standing..

## Hst 442 -Race, Class and Gender in the American West (4)

Examines the trans-Mississippi West as a cultural meeting ground and explores the racial, class, and
gender implications of new migrations to the region. Particularattention 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 aspects of the development ofcivilization in Oregon and Washington. The history 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. Emphas is 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: Upper-division standing..

## Hst 448 - U.S. Constitution: Nineteenth Century

 (4)Examines the U.S. Supreme Court's role in the construction ofmodern America; includes discussion of the Court's decisions 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 forcredit. . Prerequisite: Upper-division 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 civil liberties of American citizens.

Also offered for graduate-level credit as Hst 549 and may be taken only once for credit. . Prerequisite: Upper-division standing..

## Hst 450 -Medieval England (4)

Examines political, religious, social, and economic aspects of the his tory of England fromapproximately 800 to the end of the 14th century. Expected preparation: Upper-division standing or permis sion 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 aspects of the his tory of England fromthe 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 forcredit. .

## 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/ortime frames. Possible topics include aspects of the his tory of women and religion, women and work, women accessing power, and gender and religious identity. 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 552. .
Hst 453 - The Medieval City: Communities of Conflict and Consensus (4)
Emphasizes the social and culturalhistory 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 assess 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 thestudy of sanctity and society, religious dissent and reformation of the church, holy war and crusade, regional and national political his tories, cross-cultural studies, and other subjects. (Maximum number of credits is 12; 4 credits each for three courses with different topics.) Expected preparation:Hst 101, 354, or 355 or upperdivision standing.
Also offered for graduate-level credit as Hst 554. .
Hst 455 - Topics in Renaissance History (4)
Identifies and examines those special aspects of Western European civilization that mature roughly between 1300 and 1550 and that begin to set it apart from the 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, secularoutlook, the functions of Renais sancepatrons, political theory and the growth of the "early modern state," Neoplatonism, and the spread of the Renaissance fromItaly to Northern Europe. (Maximum number of fredits 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 cons equences of the revolutionary changes in European Christianity that occurred during the 16th century: changes that are generally labeled "The Reformation." Expected preparation: Upper-division standing.
Also offered for graduate-levelcredit 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, politicaland/or economic history of Europe in the early modern period (roughly 1515-1815). Topics will vary, but may include European financial history, thecrisis 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 forcredit. .

Hst 459 - Topics in Modern European History (4)
Examines a selected theme related to the history of modern 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. Maybe 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 His tory (4)

Examines a selected theme in the development of European thought in its social context; format includes lecture and the analysis and discussion of primary texts. 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 560 and may be taken only once forcredit. .

## Hst 461 - 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 Russian Jewry, and gender and Jewish history. Maximum numberofcredits 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 specialemphasis 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 WarI, import substitution, comparis on 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, Trotzkyite 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: Upper-division 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-levelcredit as Hst 568 and may be taken only once for credit. . Prerequisite: Upper-division standing.

## Hst 469 - History of Mexico II: 1810-1876 (4)

Study of Mexico's his tory fromthe revolutions for independence until 1876. Emphas is on the development of constitutional government, the era of reform, foreign interventions, and the restoration of the republic.
Also offered forgraduate-levelcredit as Hst 569 and may be taken only once for credit. . Prerequis ite: Upper-division 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: Upper-division standing.

## Hst 477 - Topics in Russian-S oviet History (4)

Studies selected themes on the political, social, and cultural as pects of the Imperial, Soviet, and/or postSoviet experience. Investigates the politics, controversies, and social imaginaries 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 SovietMarxism, 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 Eastern History (4)

Explores such transnational topics in the history of the Middle East as Is lamand modernity, the Middle East and the world economy, the Middle East and orientalism. Maximum number ofcredits is $12 ; 4$ credits each for three courses with different topics. Expected preparation: upper-division 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 from the late-Ottoman legacy (19th century) to an overview of the republican period(since 1923). Discussion of authoritarianismand democratization, religion and secularism, nationalismand minorities, migration and urbanization, and relations with Europe and America. Expected preparation: upper-division 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 socio-economic 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: Upper-division standing.

Also offered for graduate-level credit as Hst 588 and may be taken only once forcredit. .

## 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 historical field. The course requires students to read, review, and discuss the significant books and articles in the field. This course is the prerequis ite 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, from archival management to historic preservation and museum studies.

Also offered for graduate-levelcredit as Hst 593 and may be taken only once for credit. . Prerequis ite: Upper-divis ion standing..

## Hst 494 - Public History Seminar (4)

Engages students in advanced investigation of special topics in public history work, including archives, oral history, project design, digital history, and others. Seminars feature technical readings, group work, peerevaluation, and written projects.

Also offered for graduate-level credit as Hst 594. . Prerequisite: 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 specialemphasis 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 staffofthe 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 his torical source criticis $m$ to the varied information preserved and transmitted in cinematographic form. The subject matter will vary fromterm to term. (Maximum numberofcredits is $12 ; 4$ credits each for three courses with different topics.) Expected preparation: upperdivisionstanding.

Also offered for graduate-level credit as Hst 597. .
Hst 500 - Introduction to the Master's Program in 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 -Res earch (0-9)

See department for course description. (Credit to be arranged.) Consentof 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 His tory Internship(1-12)

Intensive, on-the-job internships with public agencies, private businesses, non-profit firms, and other groups in public his tory work. Each internship is by special arrangement and terms.
Also offered for undergraduate-level credit as Hst 404. .

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 history work. One lab course is required for graduate students taking the public history track in the M.A. in history.

Prerequisite: Hst 496 or Hst 596.

## Hst 512 - Topics in African History and Culture

 (4)An in-depth exploration ofselected 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 Hst 412. .

## Hst 513 - Topics in Trans nationalism (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 nationstate. Frameworks for study include border zones, deterritorialized nations or peoples, and global citizenship.

Also offered for undergraduate-levelcredit as Hst 413..

## Hst 514 - Graduate Res earch 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 historical 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 Hst 415..

## 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 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 Hst 416..

## 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 ofcredits is 12; 4 credits each for three courses with different topics.)

Also offered for undergraduate-level credit 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 powerstatus, Japan's emergence as an imperialist power, statesociety relations, and modernity outside Europe. (Maximum numberofcredits 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, 1945-present (4)

Selected themes in postwar Japanese history, including the Occupation reforms (1945-52) and Japan's place in the Cold W ar 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 undergraduate-level credit as Hst 422..

## Hst 523 - Topics in Chinese Social History (4)

This course will examine institutions and themesrelating 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 differenttopics.)
Also offered for undergraduate-level credit as Hst 423..

## Hst 524 - Topics in Chinese Thought and Religion

 (4)Study of selected topics in intellectual and cultural history related to Confucianism, Buddhism, Daoism, and other philosophical and religious constructs. The subject matter will vary from term to term.
(Maximum number of credits is 12; 4 credits each for three courses with differenttopics.)

Also offered for undergraduate-level credit as Hst 424..

## Hst 525-Modern China (4)

His tory of China from decline of imperial system through century of revolution that culminated in founding of People's Republic ofChina in 1949. Post-1949 focus on critical periods and issues 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, Darwinism and 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 differenttopics.)
Also offered for undergraduate-level credit as Hst 427. .

## Hst 529 - Topics in U.S. Cultural History (4)

A lecture course that explores selected topics in modern U.S. political culture and cultural expression. Maximum number of credits is 12; 4 credits each for three courses with different topics.

Also offered for undergraduate-level credit as Hst 429 .

## 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; Puritanism; race, class, and ethnicity; American Enlightenment and Revolution; Cultural Nationalism; Industrial Ethic and Pastoralism; Jacks onian Democracy; Manifest Destiny and Native Americans; Slavery and African American Culture; Evangelicalism, Reform, Abolitionism, and Feminism.
Also offered for undergraduate-level credit as Hst 430 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 War and Reconstruction; Incorporation, Labor Reform, and Utopian Thought; Populism; Progressive Reform; Two Cultures of the 1920s; Depression Realismand Radicalism; W orld War II and the Judeo-Christian Consensus.
Also offered for undergraduate-level credit as Hst 431 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 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 undergraduate-level credit as Hst 432 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 intellectualhistory, including is sues of race, class, religion and philosophy, ideology and politics, community, region, and labor.
Also offered for undergraduate-level credit as Hst 433 and may be taken only once for credit..
Hst 534 - U.S. Social and Intellectual History, 1865-present (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 undergraduate-level credit as Hst 434 and may be taken only once for credit..

## Hst 538 -American Economic History: the First Century (4)

The economic background of the War of Independence and the seeds of the Civil War. Industrialization, urbanization, and development of the frontier. Rise ofbig business and organized 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-level credit as Hst 438 and may be taken only once for credit. .

## Hst 539 - American Economic History: the 20th Century (4)

Economic impact of U.S. involvement in World War I. Postwar structural changes. Waning of lais sezfaire. Causes of the Great Depression. Economic policies of Hoover and Roosevelt administrations. TheNew Deal reforms. World War II and emergence of the adminis tered system. Evolution of the mixed economy and growing role of the government. The industrial-military complexand the social imbalance.
Also offered for undergraduate-level credit as Hst 439 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 ofthe environment, and the effect of the environment onhumans. Topics include colonialism; 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 Hst 440 and may be taken only once for credit..

## Hst 542 - Race, Class and Gender in the American West (4)

Examines the trans-Mississippi Westas a cultural meeting ground and explores the racial, class, and gender implications of new migrations to theregion. Particularattention will be placed on the arid West and human responses to landscape.
Also offered for undergraduate-level credit as Hst 442 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, fromthe 17th century
to the late 20th century, with special attention to the increas ing power and influence of the federal government and corporate institutions after 1870. Recommended prerequisite: upperdivision standing.

## Hst 544 -History of the Pacific Northwest (4)

The social, cultural, economic, and political aspects of the development of civilization in Oregon and Washington. The his tory 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 his torical 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 Hst 445 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 ofthe 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 Hst 447 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 dis cussion of the Court's decisions on federalism, slavery, presidential war powers, Reconstruction and civil rights, and industrialization.
Also offered for undergraduate-level credit as Hst 448 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, federalism, and the civilrights and civil liberties of American citizens.

Also offered for undergraduate-level credit as Hst 449 and may be taken only once for credit..

## Hst 550 - Medieval England (4)

Examines political, religious, social, and economic aspects of the history of England fromapproximately 800 to the end of the 14th century.
Also offered for undergraduate-level credit as Hst 450 and may be taken only once for credit..

## Hst 551 - Early Modern England (4)

Examines political, religious, social, and economic aspects of the history of England from the 15th through the 17th centuries.

Also offered for undergraduate-level credit as Hst 451 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 accessing 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 Consens us (4)

Emphasizes the social and cultural history of the medievalcity 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; thecommercial 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 assess how the urban community mediated conflict and sought elusiveconsensus.
Also offered for undergraduate-level credit as Hst 453 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 thestudy of sanctity and society, religious dissent and reformation of the church, holy war and crusade, regional and
national political histories, cross-cultural studies, and other subjects. (Maximum number of credits is 12; 4 credits each for three courses with different topics.)

Also offered for undergraduate-level credit as Hst 454. .

## Hst 555 - Topics in Renaiss ance History (4)

Identifies and examines those special aspects of Western European civilization that mature roughly between 1300 and 1550 and that begin to set it apart from the medievalera. 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 Renais sance patrons, politicaltheory 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 cons equences 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/or economic history of Europe in the early modern period (roughly 1515-1815). Topics will vary, but may include European financial history, thecris 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-level credit as Hst 457. .

## 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: graduate standing.

Also offered for undergraduate-level credit as Hst 458 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 modern Europe from(primarily) the 19th through the

20th centuries. Topics willvary, whether focusing internationally oron 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: Graduate standing.

Also offered for undergraduate-level credit as Hst 459. .

## 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 discussion 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 His tory (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 Israelite or rabbinic history and culture, Sephardic Jewry, history of Russian Jewry, and gender and Jewish history. Maximum number ofcredits is 12; 4 credits each for three courses with different topics.

Also offered for undergraduate-level credit as Hst 461. .

## Hst 564 - Indians of the Pacific Northwest (4)

Explores the history ofpeoples native to the Pacific Northwest with a special emphasis on natural resourceallocation and the relationships between federal, state, and tribal governments in the 19th and 20th centuries.

Also offered for undergraduate-level credit as Hst 464 and may be taken only once for credit. .

## Hst 565 - Twentieth Century Latin America (4)

Course examines: Positivism, Mexican Revolution, World War I, import substitution, comparis on 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, Trotzkyite rivalries, Dirty wars, Central American revolutions, implosion of Mexican development model,
democracy, rise of digital worlds, stimulants, tourism, Nafta, U.S. dis regard.

Also offered for undergraduate-level credit as Hst 465 and may be taken only once for credit. .
Hst 568 -History of Mexico I: $\mathbf{4 0 0 0}$ 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 undergraduate-level credit as Hst 468 and may be taken only once for credit. .
Hst 569 - History of Mexico II: 1810-1876(4)
Study of Mexico's his tory fromthe revolutions for independence until 1876. Emphas is 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 Hst 469 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 Hst 470 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 as pects of the Imperial, Soviet, and/or postSoviet 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-level credit as Hst 477. .

## Hst 578 -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 SovietMarxism, through theanalysis 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-level credit as Hst 478..

## 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 East and the world economy, the Middle East and orientalism. Maximum number ofcredits is $12 ; 4$ credits each for three courses with different topics.
Also offered for undergraduate-level credit as Hst 484. .

## Hst 586 - Modern Turkey (4)

A study of the formation and evolution of the Turkish Republic. Coverage runs from the late-Ottoman legacy (19th century) to an overview of the republican period(since 1923). Discussion of authoritarianism and democratization, religion and secularism, nationalism and minorities, migration and urbanization, and relations with Europe and America.

Also offered for undergraduate-level credit as Hst 486 and may be taken only once for credit. .

## Hst 588 - Modern Arabia (4)

A survey of the history of the A rabian Peninsula in the 19th and 20th centuries. Emphas is will be on socio-economic 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-level credit as Hst 488 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 numberofcredits is $12: 4$ credits each for three courses with different topics. Graduate cred it requires a substantial res earch paper.
Also offered for undergraduate-level credit as Hst 490..

## 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 prerequis ite for Hst 592 Research Seminar.
Also offered for undergraduate-level credit as Hst 491.. 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 Hst 492..

## Hst 593 - Introduction to Public His tory (4)

Introduction to the field of public history with special emphasis on res earch methods, procedures, and work in the practice of public history, fromarchival management to historic preservation and museum studies.

Also offered for undergraduate-level credit as Hst 493 and may be taken only once for credit..

## Hst 594 - Public History Seminar (4)

Engages students in advanced investigation of pecial topics in public his tory work, including archives, oral history, project design, digital history, 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 Hst 494. .

## Hst 595 - Public His tory 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 history work.

Also offered for undergraduate-level credit as Hst 495..

## Hst 596 - Introduction to Public His tory (4)

An introduction to the field of public history with special emphasis on theres earch 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. 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 fromterm to term. (Maximum number of credits is $12 ; 4$ credits each for three courses with differenttopics.)

Also offered for undergraduate-level credit as Hst 497. .

## 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.)

## Intl - International Studies

## Intl 195 - Colloquium (1)

Lectures by PSU and visiting scholars on major world issues.

## 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 211 - Introduction to African Studies (0-4)

In-depth interdisciplinary or topical study of one of the regional foci in the International Studies degree program.

Intl 216 - Introduction to Asian Studies (0-4)
In-depth interdisciplinary or topical study of one of the regional fociin the International Studies degree program.

## Intl 226 - Introduction to European Studies (4)

In-depth interdisciplinary or topical study of one of the regional fociin the InternationalStudies degree program.
Corequisite: Int1226B.
Intl 240 - Introduction to Latin American Studies (0-4)

In-depth interdisciplinary or topical study of one of the regional foci in the InternationalStudies degree program.

Intl 247 - Introduction to Middle Eastern Studies (0-4)
In-depth interdisciplinary or topical study of one of the regional foci in the International Studies degree program.

## Intl 296 - The United States and the World (4)

Interdisciplinary study and analysis of the role of the United States in world affairs with emphasis on the twentieth and twenty-firstcentury, relations between the U.S. and the Third World, the era of the Cold War, American globalism, diplomatic, economic, and geopolitical issues.

## Intl 299-Special Studies (1-6)

(Credit to be arranged.)

## 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 cultural importance, and their ties to political thought and history.

## Intl 321 U - Asia: Globalization and Identity (4)

Examines how Asian societies define the meaning of globalization vis-a-vis themselves and each other.

Intl 323U- Asia: Tradition and Innovation (4)
Examines how Asian societies employ the meanings of "tradition" and "innovation" to define themselves and view each other. The course looks at tradition and innovation in Asia by drawing on interd is ciplinary and multidisciplinary knowledge sources.

## Intl 331 U- Women in 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 intersectand overlap with broader cultural questions about women and their place in tradition, modernity, nation-building, Is lam, and the West. This course is the same as WS 331U and may only be taken once for credit.
Cross-Listedas: WS 331U.

## Intl 332 U- Is lamic Social Movements (4)

An overview of recent Is lamic social movements. Examines the roots and development of Islamic movements in, among others, Muslim-populated societies in the context of Social Movement Theory and globalization. Particular attention is given to the rise of Is lamic socio-political movements from their position as a local and regional force to a global socialmovement.

## Intl 341 U- Environment and Development in Latin America (4)

Examines the interrelationships between environment and development in Latin America from an interdis ciplinary perspective. Explores is sues 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: From Silver to Cocaine (4)

Explores the politics, economy, culture and environmentof Latin America from the point ofview of export commodities. Tracing commodity chains,
from silver and cocaine to bananas and soy, the course shows how these chains connect places to the world economy, and the ramifications ofeconomic dependence.

## Intl 349U- Gender and International Development (4)

Examines how the material benefits of globalization and development projects are not shared equally across gender(s). Evaluates how development theory and practice address poverty, health, environment, sexuality, population, domestic/paid work. Also examines the emergence of civilsociety; patterns of violence and political participation globally. This is the same course as WS 349U and may be taken only once for credit.

Cross-Listedas: WS 349U.

## Intl 350U- The City in Europe (4)

Focus on modern urban life since the eighteenth century and various responses to industrialization, state power, modernity, and globalization. The city provides a lens into debates on imperialism, 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 Asia that produce entertainment for worldwide consumption. We examine trans national Indian Cinema emphasizing: Globalization and the politics of trans national film production, distribution, and reception. Local-regional-global dynamics. The construction and negotiation of gender, family, nation, religion/communalis $m$, and emerg ing filmic genres. Filmic repres entation 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 362U; course may only be taken once for credit.

Cross-Listedas: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 issues, particularly questions of privacy and surveillance.

## Intl 366U- Cyberwar \& Espionage (4)

Examination of the use of cyberwarfare and espionage 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 issue, 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 imperialismin twentieth century A frica from the pers pective of post-colonial studies. This is the same course as BSt 372 U 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 emphasis 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, Repres entation and Difference in Media and Film (4)

Culture Industries such as television, film, social/digital media, community-basedmedia, 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 historical approach starting with colonialismand ending with topics of contemporary salience such as trade, financial liberalization and sustainability.

Prerequisite:Int1201 and Int1296..
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 upperdivision students 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 positivism, liberalism, and Marxismthrough multiple approaches including non-Western and comparative perspectives.

Prerequisite: Int1201 and Int1296.

## Intl 445-Cities and Third World Development (3)

Critical survey ofhistorical, economic, cultural, political, and urban aspects of Third World development, starting with the colonial era. Includes historical patterns of integration ofthe Third W orld with the emerging world market system. Covers development theories and problems of the postindependence period, focusing on urban issues and policy alternatives. This is thes ame course as USP 445 and may be taken only once for credit.
Prerequisite:Upper-divisionstanding.. 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 providestudents 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 Turkis hpolitical and economic development froma 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 providestudents with an in depth study of political development literature with a focus on modern Turkey. We will examine how modern Turkish republic emerged from the 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-listed as PS 461 and may be taken only once forcredit.
Also offered for graduate-level credit as Int1561 and may be taken only once for credit.. Cross-Listed as: PS 461.

## Intl 470 - Intercultural Leadership and 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-divisionstanding..

## 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 linguistics 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 from an interdisciplinary perspective. Recommended prerequisites: $\operatorname{Int1397}$.

## 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 providestudents with an in-depth study of political developmentliterature with a focus on modern Turkey. Examines how a modern Turkish republic emerged fromthe ashes ofthe 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 development froma global perspective.
Also offered for undergraduate-level credit as Intl 460 and may be taken only once for credit.. CrossListed 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 provide students with an in depth study of political development literature with a focus on modern Turkey. We will examine how modern Turkish republic emerged from the ashes of the Ottoman Emp ire 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-listed as PS 561 and may be taken only once for credit.
Also offered for undergraduate-level credit as Intl 461 and may be taken only once for credit.. CrossListed as: PS 561.

## ISQA - Infor Systems \& Quant Analysis

## ISQA 111 -Fundamental Computer Concepts (2)

The fundamental concepts 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 vocabulary 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 creates oftware applications that address the information needs of an organization. Introduces business students to the object-oriented design, implementation, and testing of event-driven programs. Topics include class definition, methods, datatypes, control structures, and file-based interactive input/output. Provides an overview of the industry proven softwaredevelopment principles, and outlines the contribution that business professionals make to the programdevelopment 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.)
Prerequis ite: consent of ins tructor..
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 characteristics of the modes are evaluated, freight rate derivation and analyses are understood, and org anizational evaluations of trans portation 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 for those 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 -SelectedTopics (4)

(Credit to be arranged.)

## ISQA 511 -Sustainable 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. Theaim of the course is to (1) familiarize students with the basic language, concepts, ins ights and tools of operations and supply chain management, (2) demonstrate principles and methods for integrating sustainability into an organization using concepts such as the Toyota Production System, cradle-to-cradle principles, green procurement, and life cycle analysis, and (3) explore the relationship between sustainable supply chains and local and global economies in terms ofenvironmental impact 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 Session only.

## 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, dis ruption and related volatility, power relations, uncertainty,
complexity and ambiguity and a need for navigation skills to succeed in "post-normal" 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 fores ight to real world interdisciplinary challenges. Includes an overview of settings and methods where foresight is currently being practiced in both the public and private sectors, and profiles of futuris ts who lead these processes. Focuses on methods which democratize and diversify the future.

Prerequisite: ISt 520.

## ISt 522 -Integrative Futures Practice (2)

Advanced class to integrate the coursework student has taken for his/her/their Fores ight 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 ofshared 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 -Selected Studies (1-4)
(Credit to be arranged.)

## ISt 650 -Diversity/Equity Scienceand Math Ed I

 (4)See department for a description of this course.

## 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 listening comprehension and oral practice, the elements of grammar, vocabulary building, and elementary 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. Emphas is 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, and elementary 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 second course in a sequence of three: It 201, It 202, and It 203. Recommended prerequisite: It 103.

## It 203 -Second-Year Italian Term 3 (4)

Intens ive 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 299 -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 sequenceof 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 second course 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 fromits 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, res istance, 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 history of the Italian language, from late 800 AD to 1900 . Introduction to the most representative documents thatshaped 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 -SelectedTopics (1-9)

(Credit to be arranged.)

## ITP - 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 - Class room 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, clas sroomroutines, problem-solving, decision making and responding to disruptions. Courseemphasizes 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 once forcredit. . Prerequisite: admission to the Bilingual Teacher Pathway Program, Graduate Teacher Education Program, or Secondary Dual Educator Program.

## ITP 412 - Learning and the Learner (1-3)

Candidates identify thems elves as learners, recognize the learning needs of their students, understand the learning theories relevantto educational practice, and identify the most usefulelements 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 graduate-level credit as ITP 512 and may be taken only once for credit. . Prerequisite: admission to a teacher education program.

ITP 413 - Technology as a Tool for Learning (3)
Use of digital tools to enhance teacher productivity and professional development and for planning, instruction, and assessment of student learning. Employ technology to foster information literacy and digital citizenship. Engagediverse learners in inquiry, communication and collaboration, creation, visual design, and production of media.

Also offered for graduate-level credit as ITP 513 and may be taken only once forcredit. . Prerequisite: Admis sion into the Secondary Graduate Teacher Education Program(GTEP), Secondary Dual Endorsement Program(SDEP), or the Bilingual Teacher Pathway (BTP) Programand others with instructor approval..

## ITP 414 - Educating for Equity and Social Justice

 (3)Explore issues 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 clas srooms/schools, where all students and families are valued.

Also offered for graduate-level credit as ITP 514 and may be taken only once forcredit. . Prerequisite: Admission into the Graduate Teacher Education Program(GTEP), Secondary Dual Endorsement Program(SDEP), or the Bilingual Teacher Pathway (BTP) Program and 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 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 521 and may be taken fall, winter, and spring terms forcredit. . Prerequisite: Admis sion into the Secondary Graduate Teacher Education 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
languagearts 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 graduate-level credit as ITP 522 and may be taken fall, winter, and spring terms for credit.. . Prerequisite: Admission into the Secondary Graduate Teacher Education Program(GTEP), Secondary Dual Endorsement Program(SDEP), or the Bilingual Teacher 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 res ources available to support learning. Introduces research-based instructional practices and lesson/unit planning. Situates teaching, learning, and assessment within the context ofstate and nationalstandards.

Also offered for graduate-level credit as ITP 523 and may be taken fall, winter, and spring terms for credit. . Prerequisite: Admission into the Master of Education degree programand admission 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 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 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 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 525 and may be taken fall, winter, and spring terms for credit.. . Prerequis ite: Admission into the Secondary Graduate Teacher Education Program(GTEP), Secondary Dual Endorsement Program(SDEP), or the Bilingual Teacher 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 lesson/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: Admission into a graduateteacher preparation program.

## ITP 427 -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 schools ocial studies education. Examines a variety of professional resources available to support learning. Introduces researchbased 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 527 and may be taken fall, winter, and spring terms for credit. . Prerequisite: Admission into the Secondary Graduate Teacher Education Program(GTEP), Secondary Dual Endorsement Program(SDEP), or the Bilingual Teacher 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 ins tructional practices and lession/unit planning. Situates teaching, learning, and as essment 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 forcredit. . 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 content areas (e.g., literacy, mathematics, the arts).

Also offered for graduate-level credit as ITP 542 and may be taken only once forcredit. . Prerequisite: Admission to Elementary Graduate Teacher

Education ProgramorBilingual Teacher Pathway Program.

## ITP 452 - Reflective Practitioner (1-3)

Perspectives and techniques for formal and informal analys is, information gathering, decis ion making, value judgments about educational practice.

Also offered for graduate-level credit as ITP 552 and may be taken for credit in winter and spring terms. . Prerequisite: admis sion 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 - Class roomManagement for Student Success (1-3)

Theories, principles, and practices of clas sroom management for middle and high school teachers. Topics include community, relationships, communication, culturalres ponsiveness, organizational procedures, clas sroomroutines, problem-solving, decision making and responding to
disruptions. Courseemphasizes creating positive learning environments for students fromdiverse backgrounds in multicultural clas srooms.

Also offered for undergraduate-level credit as ITP 411 and may be taken only once for credit. . Prerequisite: admis sion to the Bilingual Teacher Pathway Program, Graduate Teacher Education Program, or Secondary Dual Educator Program.

## ITP 512 - Learning and the Learner (1-3)

Candidates identify thems elves as learners, recognize the learning needs of their students, understand the learning theories relevantto educational practice, and identify the most usefulelements 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. . Prerequisite: admission to a teacher education program.

## ITP 513 - Technology as a Tool for Learning (3)

Use of digital tools to enhance teacher productivity and professionaldevelopment and for planning, instruction, and assessment of student learning. Employ technology to foster information literacy and digital citizenship. Engagediverse learners in inquiry, communication and collaboration, creation, visual design, and production of media.
Also offered for undergraduate-level credit as ITP 413 and may be taken only once for credit. .
Prerequisite: Admis sion into the Secondary Graduate Teacher Education Program(GTEP), Secondary Dual Endorsement Program(SDEP), or the Bilingual Teacher Pathway (BTP) Programand others with instructor approval..

## ITP 514 - Educating for Equity and Social Justice

 (3)Explore issues of identity, linguistics, race, ethnicity, sexual orientation, gender, social class, ability, and other forms of divers ity. Teacher candidates gain an understanding of how culture influences educational processes, as well as their role and responsibility in creating socially just and equitable clas srooms/schools, where all students and families are valued.

Also offered for undergraduate-level credit as ITP 414 and may be taken only once for credit. . Prerequisite: Admission into the Graduate Teacher Education 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 Language Learners (ELLs). Candidates learn the developmental progress of acquiring English for ELLs, and the role/responsibility of the teacher to create a positiveclimate and utilize ins tructional strategies that are culturally and linguistically responsive.
Prerequisite: Admission into the Secondary Graduate Teacher Education 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 year olds) in middle grades schools. Emphasizes identity formation, developmental responsiveness, 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: Admis sion to the Graduate Teacher Education Program, Master's in Curriculumand Instruction, and others with instructor approval..

## ITP 517 - Engaging Adoles cent Learners (3)

Approaches foreffectively educating adolescent learners. Includes student motivation and engagement, instructional strategies, developmentally responsive approaches, culturally responsive practice, and authentic learning opportunities. Examines educational policy in middle grades schools (K-8, 68) 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 Curriculum and Instruction, and others with instructor approval..

## ITP 518 - Assessment for Learning (2)

Concentrated study of key terminology around assessment and the application of multiple assessment 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 act on assessment data. Expected preparation: Admission into the Secondary Graduate Teacher Education Program.

## ITP $\mathbf{5 2 0}$-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. Emphasis on the functional teaching of reading and writing, the design and preparation of materials to use with textbooks in all school subjects.

Prerequisite: admis sionto a teacher education program.

## ITP 521 -Secondary Art Methods (2-4)

Issues and methods in selecting and org anizing materials for instruction in middle level/high art 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-level credit as ITP 421 and may be taken fall, winter, and springterms for credit. . Prerequisite: Admission into the Secondary Graduate Teacher Education Program (GTEP), Secondary Dual Endorsement Program (SDEP), or the Bilingual Teacher Pathway (BTP) Program.

## ITP 522 - Secondary English Language Arts Methods (2-4)

Issues and methods in selecting and org anizing materials for instruction in middle level/high school languagearts 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 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 BilingualTeacherPathway (BTP) Program.

## ITP 523 - Secondary Health and Physical Education Methods (2-4)

Issues and methods in selecting and org anizing 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-level credit as ITP 423 and may be taken fall, winter, and spring terms for credit. . Prerequisite: Admis sion into the Master of Education degree programand admission into Teacher Education Program.

## ITP 524 -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 professional resources available to support learning. Introduces research-based instructional practices and lesson/unit planning. Situates teaching, learning, and as sessment with in 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 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-level credit as ITP 425 and may be taken fall, winter, and spring terms for credit. . Prerequisite: Admis sion into the Secondary Graduate Teacher Education Program (GTEP), Secondary DualEndorsementProgram (SDEP), or the Bilingual Teacher Pathway (BTP) Program.

## ITP 526 -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 lesson/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: Admis sion 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 resources available to support learning. Introduces researchbased instructional practices and lesson/unit
planning. Situates teaching, learning, and assessment within the context of state and nationalstandards.

Also offered for undergraduate-level credit as ITP 427 and may be taken fall, winter, and spring terms for credit.. . Prerequis ite: Admis sion into the Secondary Graduate Teacher Education Program (GTEP), Secondary DualEndorsement Program (SDEP), or the Bilingual TeacherPathway (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 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 428 and may be taken fall, winter, and spring terms for credit. . Prerequisite: admission to the Bilingual Teacher Pathway Program.

## ITP 529 - Professional Seminar -S econdary (1)

A companion seminar during Student TeachingI 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.
Prerequisite: 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 Supervis or. In addition, teacher candidates will participate in related professional activities at their placement school. Candidates will engage in ongoing inquiry and connection between theory and practice.

Prerequisite: Admission to the teacher education program; successful completion of Initial Field Experience.

## ITP 531 - Student Teaching II, Middle/High School (13)

Teacher candidates will collaborateand independently plan, teach, as sess, and reflect under the guidance of their Cooperating Teacher and University Supervis or. In addition, teacher candidates will participate in related professional activities at their placement school. Candidates will engage in
ongoing inquiry and connection between theory and practice.

Prerequisite: Admission to the teacher education programand ITP 530..

## ITP 532 -Student Teaching I, Art/Music/PEK-12 (8)

Teacher candidates will collaborate and independently plan, teach, as sess, and reflect under the guidance of their Cooperating Teacher and Univers ity Supervis or. In addition, teacher candidates will participate in related professional activities at their placement school. Candidates will engage in ongoing inquiry and connection between theory and practice.
Prerequisite: Admission to the teacher education program; successful completion of Initial Field Experience..

## ITP 533 - Student Teaching II: Art/Music/PEK12 (13)

Teacher candidates will collaborate and independently plan, teach, assess, and reflect under the guidance of their Cooperating Teacher and University Supervis or. In addition, teacher candidates will participate in related professional activities at their placement school. Candidates will engage in ongoing inquiry and connection between theory and practice.
Prerequisite: Admis sion 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 organize instruction for English Language Learners (ELL). Candidates learn the developmental progress of acquiring English for ELL students, and the role/responsibility of teacher to create a positiveclimate and utilize instructional strategies that are culturally and linguistically responsive.
Prerequisite: Admis sion into the Elementary Graduate Teacher Education Program. Prerequis ites: Admission into the Elementary Graduate Teacher Education Program, Secondary Dual Endorsement Program(SDEP), or the Bilingual Teacher Pathway (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 environmentof a classroomin a way that is
responsive to students and supports learning. Summer and fall terms involve face-to-facesessions addressing classroom climate 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 best meet learners' needs.

Prerequisite: admis sion to Elementary Graduate Teacher Education Program.

## ITP 537 - Instructional Design and Ass essment (13)

This yearlong course explores the theoretical frameworks and practical strategies that as sist novice teachers in planning effective classroom curricula, 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 content areas, and place-based, project based approaches to teaching and learning in grades PreK-8. Des ign integratedunits ofstudy that focus on socialstudies, 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 assessment 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.

Prerequis ite: Admission 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 PK-3. Examine emergent and early reading processes, how to assess them, and how to support their development in clas srooms. 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: admis sion to Elementary Graduate Teacher Education Program.

## ITP 542 - Integrated Elementary Science Methods

 (2)Emphas is 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).

Also offered for undergraduate-level credit as ITP 442 and may be taken only once for credit. . Prerequisite: Admis sion 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 professional learning centered on improvement of field-based practices to support learners. Candidates will engage in systematic observation and examination ofone'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 (14)

Observation, collaborative and independent planning, teaching, as sessment, and reflection under the guidanceof the Cooperating Teacher and University

Supervis or, 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 clas sroomteacher and University supervis or. Direct res ponsibility for learning activities, developing skills in techniques of teaching and classroom management; related professional activities. Weekly seminar.

Prerequisite: admis sion 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 guidanceof the Cooperating Teacher and University Supervis or, related professional activities. Ongoing inquiry and connection of theory and practice, including methods coursework. Completion of the second unit of study. Seminar meetings and program events.

Prerequisite: admissions to theElementary Graduate Teacher Education Program.

## ITP 548 -Student Teaching I, Elementary (1-4)

Observation, collaborative and independent planning, teaching, as sessment, and reflection under the guidanceof the Cooperating Teacher and University Supervis or, related professional activities. Ongoing inquiry and connection of theory and practice, including methods coursework.
Prerequisite: Admission to the teacher education program.

## ITP 549 - Student Teaching II, Elementary (6-9)

Observation, collaborative and independent planning, teaching, as sessment, and reflection under the guidanceof the Cooperating Teacher and University Supervis or; related professional activities. Ongoing inquiry and connection of theory and practice, including methods coursework. Completion of the first unit of study.

Prerequisite: Admission to the teacher education program.

## ITP 550 - Student Teaching III, Elementary (12)

Observation, collaborative and independent planning, teaching, assessment, and reflection under the guidanceof the Cooperating Teacher and University

Supervis or, related professional activities. Ongoing inquiry and connection of theory and practice, including methods coursework. Completion of the second unit of study. Seminar meetings and program events.

Prerequisite: admission to Elementary Graduate Teacher Education Program.

ITP 551 - Research and Class room 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 ofgathering and analyzing clas sroomdata. Identify area of focus about an aspect of teaching and/or learning to systematically study during clinical experience.

Prerequisite: Admission to the teacher education program.

## ITP 552 - Reflective Practitioner (1-3)

Perspectives and techniques for formal and informal analys is, information gathering, decis ion making, value judgments about educational practice.
Also offered for undergraduate-level credit as ITP 452 and may be taken forcredit in winter and spring terms.. Prerequisite: 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 guidanceof the Cooperating Teacher and University Supervis or, related professional activities. Ongoing inquiry and connection of theory and practice, including methods coursework. Completion of the first unit of study. Seminar meetings and program events.

Prerequisite:Admission to the Secondary Dual Educator Preparation Program.

## ITP 581 -Student Teaching II in Inclusive ML/HS (12)

Observation, collaborative and independent planning, teaching, as sessment, and reflection under the guidanceof the Cooperating Teacher and University Supervis or, related professional activities. Ongoing inquiry and connection of theory and practice, including methods coursework. Completion of the second unit of study. Seminar meetings and program events.

Prerequisite:Admission to the Secondary Dual Educator Preparation Program.

## Jpn - Japanese

Jpn 101 - First-Year Japanese Term 1 (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 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 lis tening 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 Japanes e Term3 (5)

An introduction to the Japanese language with emphas is 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, the syllabaries, 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 Term 1 (4)

Continued work in the Japanese language with emphas is 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 Japanes e: Speaking and Listening Term 2 (4)

Continued work in the Japanese language with emphas is 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 sequenceoftwo: 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 emphas is 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 oftwo: 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 emphas is 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 sequenceoftwo: 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 transfer students, majors, and teachers. This is the second course in a sequenceoftwo: 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 respectto 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.

Prerequisite: 8 cr of literature. Prerequisite: 8 credits of literature.

## Jpn 341 U- 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 ofliterature.

## 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 ofGenji, plays by Zeami and Chikamatsu, Basho's haiku, and masterpieces of modern fiction. Jpn 341 focuses on classicaland 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 prerequisite: 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 ofGenji, plays by Zeami and Chikamatsu, Basho's haiku, and masterpieces of modern fiction. Jpn 341 focuses on classicaland 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, Japanes e Graphic Novels (4)

Readings ofmasterpieces 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 ofnew, critically acclaimed Japanese comic books and analysis of recent writings about the graphic-novel form. Readings of the mangaare 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 361 U- Japanese Literature Through Film (4)

Readings ofmasterpieces 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 oforal communication, reading, and writing skills with complex patterns in informal and formal situations. This is the first course in a sequence oftwo: 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 forcredit. .

## 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 oftwo: 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 forcredit. .

## 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 forcredit.. 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 J apanese Liter ature (4)

Reading, analysis, translation, and discussion of representative literary texts. Jpn 420/520 will focus on pre-modern 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 oftwo: 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 forcredit. .

## Jpn 421 - Readings in Japanese Literature (4)

Reading, analysis, translation, and discussion of representative literary texts. Jpn 420/520 will focus on pre-modern 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 oftwo: 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 forcredit. .

## 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 them in 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 once forcredit..

## Jpn 423 - Introduction to Modern Japanese Poetry (4)

An introduction to modern Japanesepoetry 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 pop culture including free verse, traditional tanka, song lyrics, and comic books (manga). Students read verse in Japanese, analyze syntax, learn genre requirements, and understand the his tory of modern Japanese poetry and songs; students analyze sequential-art narratives to understand multiple aspects of Japanese pop culture.
Also offered for graduate-level credit as Jpn 524 and may be taken only once forcredit. . 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 Kanji-based. 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 sequenceoftwo: 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 forcredit. .

## Jpn 478 - Teaching Japanese As a Foreign Language (4)

Principles of instructional methods in teaching Japanese to speakers of languages whose orthography is not Kanji-based. 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 second course in a sequence oftwo: 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 forcredit. .

## Jpn 494 - Japanese S ociolinguistics (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 forcredit. .

## 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 -Selected Topics (1-12)

(Credit to be arranged.)

## Jpn 511 - Advanced Japanese (4)

Development of oral communication, reading, and writing skills with complex patterns in informaland formal situations. This is the first course in a sequence oftwo: Jpn 511 and Jpn 512.
Also offered for undergraduate-level credit 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 oftwo: 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-level credit 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 thestudy of Japanese grammar for advanced students and majors, and for teachers.

Also offered for undergraduate-level credit as Jpn 414 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 pre-modern 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 Jpn 420 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 pre-modern 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 oftwo: Jpn 520 and Jpn 521.

Also offered for undergraduate-level credit as Jpn 421 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 them in 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 Jpn 422 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 pop culture including free verse, traditional tanka, song lyrics, and comic books (manga). Students read verse in Japanese, analyze syntax, learn genre requirements, and understand the his tory ofmodern Japanese poetry and songs; students analyze sequential-art narratives to understand multiple aspects of Japanese pop culture.
Also offered for undergraduate-level credit as Jpn 424 and may be taken only once for credit. . Prerequisite: 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 from year 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 linguisitcs 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 Kanji-based. 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 sequenceoftwo: Jpn 577 and Jpn 578.

Also offered for undergraduate-level credit 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 Kanji-based. 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 second course in a sequence oftwo: Jpn 577 and Jpn 578.

Also offered for undergraduate-level credit 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 systemand civilization fromthe 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 originalhistorical, 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 Hst 311. .

## JSt 317U- Jewish History from Antiquity to the Medieval Period (4)

Introduces students to the Jewish historical experience from its Biblical origins through the end of the first millennium CE primarily by means of close readings of primary sources. Describes the diverse forms of Jewish life under Persian, GrecoRoman, Early Christian and Muslimrule 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 Is lamic and Christian realms, early modern 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 Hst 319 U and may be taken only once for credit.

Cross-Listedas:Hst 319U.

## JSt 324U- Historical Introduction to the Hebrew Bible/OldTestament (4)

Historical survey of Hebrew Bible/Old Testament. Investigates Is raelite religion in the context of the Ancient Near East, exploring ideas about community, sanctity, social justice, prophesy, wisdom, 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)

Investigates the foundation and development of an Is raelinational culture and its role in shaping contemporary Is raeli society. Explores how history, politics, gender, religion, and ethnicity operate in the public arena. Key topics include myth and memory, public and state events, 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-Israeli conflict. Investigates the history and experiences of a diverse array of women in Israel, including Jewish women, Israeli Arab and Palestinian women, and foreign workers.

## JSt378U- 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-Listedas:Hst 378U.
JSt379U- History of Zionis m (4)
Zionismas ideology and practice in context of Jewish and Europeanhis tory. Includes society and culture Zionismcreated 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.

## JSt380U- 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 thes ame course as Hst 380U and may be taken only once for credit.
Cross-Listed as:Hst 380U.

## JSt381U- 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 mysticalvisions in ancient Jewish texts, medieval Kabbalah and the Zohar, the Sabbatean messianic movement, Has idism, 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 Is rael (4)

Surveys the evolution of modern Is rael, exploring social, political, cultural, and intellectual developments from 1880 to the present. Topics include the emergence of the Zionist movement; political, cultural, and social developments before and after 1948; the Arab-Israeli conflict; and the social framework of Israeli society.

## JSt 399 -Special Studies (1-4)

(Credit to be arranged.)

## JSt 401 - Res earch (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- (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 Mes sianism (4)

Messianic ideas in Judaismand other religions. Can focus on specific messiah figures and movements, comparative messianis ms, his torical and conceptual development ofmessianic idea, and/or modern manifestations. Repeatable once with departmental approval.

Prerequisite: 8 upper divis ion credits in Judaic Studies, or related courses with permission of instructor..

## JSt 431 - The Arts and the Jewish Experience (4)

Examines the connection between Jewish culture and the visual, literary, and/or performing arts. Inves tigates the diversity of Jewish experience, the formation of Jewish identity, and the interpretation of Jewish arts through lectures, workshops with artists, and attendance of events such as films, exhibits, readings, and/or performances.

Prerequisite: Upper-divisionstanding..
JSt 435 -Jewish and Israeli Dance History (4)
Examines the development of Jewish and Israeli dance in the twentieth century. Exploring social and concert dance forms, topics include the development of Israeli folk dance; works of American Jewish choreographers such as Fiddler on the Roof; the Batsheva Dance Company, Ethiopian and Yemenite Jewish dance companies in Israel.
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 sequenceof three:Kor 101, Kor 102, and Kor 103.

## Kor 101H-1 st Year Korean Heritage 0

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 102H-1st Year Korean Heritage 0

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 emphas is 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 emphas is 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 0

Continued work in the Korean language with emphas is 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 emphas is 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 Kor203. Recommended prerequisite: Kor 103.

## Kor 202H-2nd Year Korean Heritage 0

Continued work in the Korean language with emphas is 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 emphas is on listening comprehension, speaking, reading and writing, and grammatical patterns. This is the third course in a sequence of three:Kor201, Kor 202, and Kor 203. Recommended prerequisite: Kor 103.

Kor 203H-2 nd Year Korean Heritage $\mathbf{0}$
Continued work in the Korean language with emphasis on lis tening 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 emphas izes listening and speaking skills; 302 reading, writing, and vocabulary development. 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 emphas izes lis tening and speaking skills; 302 reading, writing, and vocabulary development. This is the second course in a sequence of two: Kor 301 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 Korea by means of watching and discussing selected Korean movies that offer rich cultural and his torical 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 (112)
(Credit to be arranged.)

Kor 409 - Practicum (1-6)
(Credit to be arranged.)

## Kor 410 -SelectedTopics (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 ofgrammar, 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 to elementary Latin. Emphas is on the elements ofgrammar, 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 program and 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.)

## 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 ofone 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 ofone text, orseries of texts, prose or poetry, with special attention on syntax, style, and culturalmilieu. 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 341 U- 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 - Res earch (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 -SelectedTopics (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 res ources, such as the card catalog, reference materials, and electronic resources, 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 -Res earch (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)
(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. Traditional genres such as picture books, traditional tales, modern realism, romance, adventure, mystery, historical fiction, science fiction, fantasy, biography, poetry, and
nonfiction. Study of literature that illustrates cultural diversity. Resources for selection; awards and honors.

Also offered forgraduate-level credit 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 resources, graphic novels, and other materials featuring authors and illustrators whodominate the YAL landscape.
Also offered forgraduate-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. Emphasis is on the selection, evaluation, andutilization ofliterature in the classroomand library media center.
Also offered forgraduate-level credit as Lib 532 and may be taken only once for credit..

## 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 themin 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-Thes is (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)

(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, historical fiction, science fiction, fantasy, biography, poetry, and nonfiction. Study ofliterature that illustrates cultural diversity. Resources 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 illustrators 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, story telling, 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 schoolstudents. Emphasis is on the selection, evaluation, andutilization of literature in the classroomand 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, orhigh school clas srooms. A major focus will be on selecting reading materials and using them in the library and clas sroom.

Also offered for undergraduate-level credit 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 personnel, programbudgeting, facility planning, role of state and nationals tandards 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 useofinstructionalmedia forK-12 including instructional design and criteria for quality print and non-print media. Learn graphic techniques and uses of computers and technology in production of instructional media. Research current practices in library and classroominstruction 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, biographicaltools, geographicaltools, dictionaries, government documents, and specialized materials. Research in referenceservices and technological delivery systems.
Prerequisite:Lib 428/528.

## Lib 542 - Collection Development and Evaluation (3)

Principles and practice ofevaluation, selection, and acquisition of all types of materials included in a school library collection. Selection and collection development policies and procedures. Study of profes sional evaluation 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 classroomcurriculum, 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 student teaching in a library media center under the direction of a supervising library media teaching and university supervisor. Observation and participation in teaching, adminis trative and other responsibilities of a library media specialist. Opportunities for involvement in student learning activities, development of teaching skills, basic skills in management and discipline ofstudents.

Prerequisite: admission to the programand approved application..

## Lib 555 -Student Teaching II (15)

Ten weeks of full-time student teaching in a school library media center under the supervision of a library media teacher and university supervisor. Participation in a full range of teaching, adminis trative, and other responsibilities of a library media specialist. Direct responsibilities for student learning activities, development ofteaching skills, creating a climate conducive for learning; management and discipline ofstudents, and related professionalactivities. Weekly seminar.

Prerequisite: admis sion to programand approved application..

## Lib 561 -School Library Practicum: Elementary

 (3)A planned experience consisting of practical application of the full range of roles and responsibilities of the SchoolLibrarian in an elementary school library under the direction of a supervis ing elementary school library teacher and a University supervisor.
Prerequisite: admission to 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 anda University supervisor.

Prerequis ite: admis sion to the School Library Endorsement Program.

## Lib 573 - Advanced Methods and Procedures in School Library/Media Centers (3)

A study of the school library/med ia 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 oflibrary/media centers required.
Prerequisite: Educational Media Endorsementor consent of instructor..

## Lib 574 - Res earch 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 consentof instructor..

## Lib 575 - Directed Field Experience (3)

Planned contact for school library media specialists with professional 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 intens ives tudy of related advanced issues such as automation, personnel, and management.
Prerequisite: EducationalMedia Endorsementor consentof 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 developmentof library media centerprograms.

Prerequisite: EducationalMedia Endorsement or consent of instructor..

## Lib 587 - Video Production (3)

Study and practice video production techniques, including storyboarding, camera techniques, editing, and preparing video forvarious educational settings. Design activities that engage students in digital video production and produce videos for library or classroomuse.

## 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 that effectively use media and technology to engage and supportstudents.

## 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 sroominstruction 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)

(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 -Selected Topics (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 101 - Pre-Entry ProgramGrammar/Writing (8)

An introduction to form, meaning and use of simple presentand 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 bas ic rules for capitalization, punctuation and spelling; practice good penmanship.

## Ling 104 - Pre-Entry Program Reading (6)

An introduction to basic reading skills including phonics, basic comprehension, fluency, sequence, word analys is; finding the topic. Introduction to basic dictionary skills and extensive reading. Emphas is on building vocabulary and decoding strategies to aid in fluency and reading for basic understanding.

## Ling 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 negatives tatements in the present tenses; describing people, places, things and activities; giving pers onal information, express-ing wants, needs and likes. Emphas is is on pro-nunciation and understanding and being under-s tood in simple conversational situations.

## Ling 111 - Grammar/Writing Level 1 (8)

Continued focus on sentence structure and developing basic single 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; demons tratives; and prepositions.

## Ling 114 -Reading Level 1 (4)

Continued focus on basic reading skills, as well as introduction to skimming and scanning, differentiating main ideas fromsupporting 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, syllabification, and word stress. Continued emphasis on building vocabulary and honing skills through reading short, adaptedmaterials.

## Ling 115 - Writing Workshop for Non-native Writers (4)

Designed for writers whose first language is not English to develop theirskills and confidence in writing for college. Focuses on the rhetorical structures of American College-levelacademic writing including es say structure, summaries, responses, and res earch writing. In addition, students work on grammar and sentence structure problems which occur more often in non-native writing and do peerediting and self-editing. Understanding complex ass ignments, synthesizing ideas, and strategies for test taking are also addressed.

## Ling 116 -Speaking/Listening Level 1 (4)

Continuedemphasis is on developing confidence, comprehensibility, and skills in basic social interactions, including participating in conversations, asking 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.

## Ling 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 fores say organization; and formatting rules. Emphas is on expanding single paragraph essays into longer es says. Expandedutilization of modalauxiliaries and introduction to present perfect tense, gerunds and infinitives, passive voice, real conditional, comparative and superlative adjectives, and adverbs.

## Ling 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.

## Ling 126 - Speaking/Listening Level 2 (lowintermediate) (4)

Identify meaningful information fromshort lectures and conversations; practice with question forms in present, past, future, and presentperfect tenses; conduct interviews; plan and deliver short oral presentations. Continued improvement of pronunciation skills, including stress, intonation, and reductions.

## Ling 131 - Grammar/Writing Level 3 (intermediate) (8)

Introduction to cause/effect and argumentation as rhetorical styles; practice narrowing a topic, developing 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 adverbialclauses. Introduction to past perfect and future perfect tenses, subordinate clauses, parallel structure, and relative clauses.

## Ling 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 from opinion, determining author's purpose, paraphrasing and summarizing points, and identifying elements of fiction. Expansion anduse of academic vocabulary.

## Ling 136 -Speaking/Listening Level 3 (intermediate) (4)

Emphasis on taking organized notes using symbols and abbreviations, understanding main ideas and examples, and identify ing lecture cues fromacademic lectures. Improve skills needed for focused small group discussions, impromptu speaking, and individual and group presentations using information gathered frominterviews.

## Ling 142 - Advanced English Grammar for Nonnative 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 selfediting techniques. Students should have a basic foundation in English grammar including the English verb tense systemand simple, compound and complex sentence structures.

## Ling 143 - Guided Research Writing for Nonnative 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 from sources foruse in writing. Students must have a basic foundation in academic writing in order to enroll in this course.

## Ling 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 ofview 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.

## Ling 147 - Understanding Academic Lectures (4)

Students prepare for the demands of understanding academic lectures in university contexts. Focus in on developing skills and strategies to increase effective lecture listening, note-taking, and retrieval and application of information.

## 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 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 nonnative 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.

## Ling 153 - Independent Research Writing for Non-native 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 froms ources into a well developed, clearly organized and accurately documented paper. Students taking the course should have experience writing basic sourcebased essays with a thesis and documentation.

## Ling 154 - Advanced Academic Reading for Nonnative Speakers (4)

Students expand ability to efficiently and effectively read academic texts. Students lead group dis cussions 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.

## Ling 155 -Dis cussion 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.

## Ling 156 - Public Speaking for Non-native Speakers (4)

Students learn techniques for developing and delivering both impromptu and prepared speeches. Emphasis will be given to developing strategies to reduce nervousness, organize ideas, produce grammatically accurate language and improve pronunciation and overall oralquality.

## 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, pers onalized 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 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.

## Ling 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 one-year academic plan.

Prerequisite: (Ling 131, Ling 134, and Ling 136) or placement into Ling 142, Ling 143, Ling 144, Ling 147 or higher..

## Ling 172 - Pathways Intermediate Seminar (2)

Supports students in level 5 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 classrooms. The work that students are doing in their IELP and PSU courses are the basis of most classroomactivities. Students evaluate and update their academic plans in consultation with their academic advis or in their major, strengthening their connection to their academic departments.
Prerequisite:Ling 142, Ling 143, Ling 144, Ling 147, and Ling 171..

## Ling 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:Ling 142, Ling 143, Ling 144, Ling 147, and Ling 171..

## Ling 182 -Social Media: Interacting Online (4)

Students develop computer communication skills by examining and researching thesocialaspect 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 and editing 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. Culturalthemes rotate each term.

## Ling 185 - Practically Speaking: Convers ational English (4)

Students improve conversational fluency by learning strategies fororalcommunication and focusing on common words and phrases used in spoken American English. Learn about the cultural knowledge required to navigateeveryday interactions. Improve pronunciation and practicespeaking in authentic situations.

## Ling 186 -Communication through Volunteering (4)

This course provides community and classroom opportunities for the development of oral communication 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 orbehaviors?

## Ling 233 - Language and Mind (4)

General introduction to what languages are like, how they are used, and how they vary, focusing on how 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 languagerepresented 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 ofendangered native languages of North America. Topics includes tructure of native languages; relationship of language to other as pects of culture such as worldview, social organization, 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 show how opinion and unexamined biases about language develop into language ideologies and, subsequently, shape language policy and US American 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 briefsketch placing English in historical perspective, and a preliminary examination of principles in modern language study.

## Ling 391 - Introduction to Applied Linguistics (4)

Survey of topics notcovered in detail in Ling 390 including language acquisition, historical linguistics and discourse analysis. Different theoretical perspectives relevant for applied linguistics are introduced and students develop their analytic skills with a special focus on the effective and disciplineappropriate reporting of these analyses.
Prerequisite:Ling 390..

## Ling 392 - Structure of the English Language (4)

A study of basic English grammar with an emphas is on describing grammatical forms and their functions in communication. Expected preparation orcorequisite: Ling 390.

## Ling 399 -Special Studies (1-8)

See department for course description. (Credit to be arranged.)

## Ling 401 - Research (1-6)

See department forcourse 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 (112)

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", "Critical Linguistics", and "Language in Cyberspace". In addition, students will be guided in preparing résumés and CVs forgraduate 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 permission.

## 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 -SelectedTopics (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 basic results of research.

Also offered for graduate-level credit as Ling 511 and may be taken only once for credit. . Prerequis ite: Ling 390 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-discipline and some training in linguistic analys is and argumentation.

Also offered for graduate-level credit as Ling 512 and may be taken only once for credit.. Prerequisite: Ling 390 and Ling 415/Ling 515.TESOL program.

## Ling 414 -Linguistic Pragmatics (4)

A study of current theories of language use, particularly contextual and functional aspects of communication. Strongly recommended:Ling 391.

Also offered for graduate-level credit as Ling 514 and may be taken only once for credit. . Prerequis ite: Ling 390 ..

## 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 concurrent enrollment.

## Ling 416 - Discourse Analysis (4)

The examination offorms and functions in dis course. Using several analytic procedures for understanding how convers ation works, especially as applied to language learning and teaching. Strongly recommended: Ling 391, Ling 392.
Also offered for graduate-level credit as Ling 516 and may be taken only once for credit. . Prerequisite: Ling 390..

## Ling 417 - Endangered Languages (4)

How and why languages are endangered in the Pacific Northwest and 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 graduate-level credit as Ling 517 and may be taken only once for credit..

## 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 assumptions that underlie morphological analysis, and some applications ofmorphological analysis. Strongly recommended: Ling 392.

Also offered for graduate-level credit as Ling 518 and may be taken only once for credit. . Prerequisite: Ling 390..

## 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. Strongly recommended: Ling 391, Ling 392.

Also offered for graduate-level credit as Ling 519 and may be taken only once for credit. . Prerequisite: Ling 390..

## Ling 420 - Historical and Comparative Linguistics

 (4)Study of language relationships and language change. Topics include thegenetic classification of languages, language and prehistory, methods of historicalreconstruction, and language contact. Strongly recommended: Ling 392. Recommended: Ling 391.

Also offered for graduate-level credit as Ling 520 and may be taken only once for credit. . Prerequisite: Ling 390 ..

## 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 address 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 dataaboutculture 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.. Prerequisite: Sophomore-standing..

## Ling 432 - Sociolinguistics (4)

Examines the role of language in society and how social factors can influence language. The social issues around language including language policy and language ideology. Strongly recommended: Ling 391.

Also offered for graduate-level credit as Ling 532 and may be taken only once for credit. . Prerequisite: Ling 390 ..

## 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. . Prerequis ite: Ling 390 or (Psy 200 and Psy 204).

## 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 inLing 390 and Ling 391.
Also offered for graduate-level credit as Ling 535 and may be taken only once for credit. . Prerequis ite: Ling 390 and Ling 391..

## Ling 437 - First Language Acquisition (4)

Introduction to main aspects of first language acquisition in childhood, frominfancy to the early 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 analysis of child language data required. Strongly recommended:Ling 391.

Also offered for graduate-level credit as Ling 537 and may be taken only once for credit. . Prerequisite: Ling 390..

## Ling 438 - Second Language Acquisition (4)

Introduction to main aspects 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 once for credit. . Prerequis ite: Sophomore-standing..

## Ling 439 - Language Ass essment (4)

Theoretical background 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 informdecis ions about individual language ability.
Also offered for graduate-level credit as Ling 539 and may be taken only once for credit. . 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 the rapidly growing field of cognitive science. Strongly recommended: Ling 391.
Also offered for graduate-level credit as Ling 545 and may be taken only once for credit. . Prerequisite: Ling 390..

## Ling 453 - Graduate Preparation: Research and Writing for Non-Native Speakers (4)

Students refine their academic writing skills through research and citation. The course also focuses on recognizing and producing vocabulary and grammar appropriate to graduate-levelwriting.

Prerequisite:upper-division standing and IELP programapproval..

## Ling 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 graduatelevel reading. Students utilize technology to organize and manage readings, cite sources, and expand academic vocabulary.
Prerequisite:upper-division standing and IELP programapproval..

## Ling 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 dis cussion. Emphasis is also on expanding interpersonal language skills and crosscultural skills in an academic environment.
Prerequisite: upper-division standing and IELP programapproval..

## Ling 457-Writing Workshopfor Multilingual Graduate Students (2)

The Graduate Writing Workshop is a 2 -credit course designed to support multilingualgraduatestudents with theirexisting 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..

## 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 classroom, 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 grammar test..

## 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 Int1471. 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: Int1471.

## 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 useful for students planning to teach pronunciation ofother 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..

## Ling 473 - 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 graduate-level credit as Ling 573 and may be taken only once for credit. . Prerequisite: Ling 477. .

## Ling 475 - Curriculum Design and Materials Development in TESOL (4)

Principles of curriculumdesign and instructional materials development in teaching Englishto speakers ofother 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 sessions 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 classroom teaching focused on theoretical and practical perspectives on classroom teaching 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 once for credit. . Prerequisite: Sophomore-standing..

## Ling 478 - TESOL Methods II (4)

The second in a two-course sequence on classroom teaching. TESOL Methods II uses classroom observation and practice teaching as a basis to study theoretical and practical perspectives on classroom teaching and learning. Significant out-of-class time for group work, classroomobservation 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 for credit.. Prerequisite: Ling 477/Ling 577..

## Ling 480 - Bilingualism (4)

Survey of is sues involved with bilingualism throughout 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. Strongly recommended:Ling 391.

Also offered for graduate-level credit as Ling 580 and may be taken only once for credit. . Prerequis ite: Ling 390..

## Ling 481 - World Englis hes (4)

Explores the role of English as a world language. Using film, audio tapes, and English language newspapers fromaround the world, students will become familiar with such Englishes as Malaysian English, Indian English, Nigerian English, and Filipino English. Strongly recommended:Ling 391.
Also offered for graduate-level credit as Ling 581 and may be taken only once for credit. . Prerequis ite: Ling 232 or Ling 390..

## Ling 482 - Pidgins and Creoles (4)

Introduces students to the language varieties aris ing in contact situations. Concentration on African and New World creoles (and African American Vernacular English). Considers the formation of pidgins and creoles in terms ofboth first and second language acquisition. Looks at thesocial factors involved in their creation. Strongly recommended: Ling 391, Ling 392.

Also offered for graduate-level credit as Ling 582 and may be taken only once for credit. . Prerequis ite: Ling 390 .

## Ling 490 - History of the English Language (4)

A survey in which the development of English phonology, morphology, vocabulary, and syntax is studied through the application of modern linguistic criteria and methodology. Expected preparation: Ling 390.

Also offered for graduate-level credit as Ling 590 and may be taken only once for credit. .

## 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 - SelectedTopics (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 be represented, and what theories have been advanced to explain thosepatterns. Some historical background to the subdiscipline and some training in linguistic analys is and argumentation.

Also offered for undergraduate-level credit as Ling 412 and may be taken only once for credit..
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 soundsystemof English, represent its phonology with basic formalisms, and compare this systemto that of other languages. This knowledge will enable students to diagnose and remediate problems learners might have with the sound system of 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-level credit as Ling 414 and may be taken only once for credit. Prerequisite:Ling 521 orLing 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-level credit as Ling 415 and may be taken only once for credit. . Prerequisite: Ling 513 orLing 390.

## Ling 516 - Dis course Analysis (4)

The examination of forms and functions in dis course. Using several analytic procedures for understanding how convers ation 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 Northwest and 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 for credit.

## Ling 518 - Linguis tic 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 assumptions that underlie morphological analysis, and some applications ofmorphological 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 orLing 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 historical 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 graduatestudents a foundation in grammar terminology and skills for conducting and writing up analyses of language datato be applied in both res earch and teaching. The course examines patterns of language use across different registers of English and how other languages differ fromEnglish in encoding similar information. It also builds awareness of world varieties of English. Students will also become familiar with commonly used databases for conducting language research.

## Ling 531 - 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 address 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 dataaboutculture 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-level credit 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 - Ps ycholinguistics (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-level credit 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 res earch 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-level credit 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 the early 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 analysis of child language data required.

Also offered for undergraduate-level credit as Ling 437 and may be taken only once for credit. . Prerequisite: Ling 513.

## Ling 538 -Second Language Acquisition (4)

Introduction to main aspects 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. 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 background 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 informdecisions about individual language ability.

Also offered for undergraduate-level credit as Ling 439 and may be taken only once for credit. . Prerequisite: 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 the rapidly growing field of cognitive science.
Also offered for undergraduate-level credit as Ling 445 and may be taken only once for credit. . Prerequisite:Ling 521 orLing 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 criticalreading,
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 res earch question(s) for their M.A. thes is proposal.

Prerequisite: admis sion to the M.A. TESOL program and 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 qualitativetechniques. Students write a preliminary draft of the methods section for their M.A. thes is proposal.

Prerequisite: Ling 560 (no concurrent enrollment 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 necessary for discussing and critically evaluating research articles, skills forsynthesizing research articles, and identifying and evaluating research methodologies. Students will also practice skills for proactively searching out information to better understand research so they can continue to be critical consumers of research as they enter the teaching profession.

Prerequisite: Graduate standing and 12 credits of Applied Linguistics at the 500-level including Ling 521.

## Ling 566 - Culminating Workshopfor TESOL and Applied Linguistics (4)

W orkshop 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, develop job 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 classroom, and how to adapt and supplement ESL grammar tests.
Also offered for undergraduate-level credit 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 useful for 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 orLing 513 or consent of instructor..

## Ling 573 - Computer AssistedLanguage 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 for credit. . Prerequis ite: 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 as ess 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. Recommended: Ling 478 or teaching experience.
Also offered for undergraduate-level credit as Ling 475 and may be taken only once for credit. . Prerequisite: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 sessions 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 classroom teaching focused on theoretical and practical perspectives on classroom teaching 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 classroom observation and practiceteaching as a basis to study theoretical and practical perspectives on classroom teaching and learning. Significant out-of-class time for group work, classroomobservation 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 undergraduate-level credit 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 bilingualism throughout 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 fromaround the world, students will become familiar with such Englishes as Malaysian English, Indian English, Nigerian English, and Filipino English.

Also offered for undergraduate-level credit 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 aris ing in contact situations. 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 theircreation.

Also offered for undergraduate-level credit as Ling 482 and may be taken only once for credit. .
Prerequisite: Ling 390 or Ling 513 or Ling 521.
Ling 590 - His tory of the English Language (4)
A survey in which the development of 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

## 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 assignments and class projects.
Prerequisite: Mth 251 (concurrent enrollment allowed) or Mth 252. .

## ME 121 - Introduction to Systems and Control (3)

An introduction tosensors and control of electromechanical systems. Students assemble an electromechanical systemand programa microcontroller to sense the systemstate and maintain systemequilibrium. Students build on the skills developed in ME 120. Written and oral
communication is required to complete assignments and class projects.
Prerequisite:ME 120 with a grade ofC orbetter..

## 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:ME 121 with a grade ofC orbetter..
ME 199-Special Studies (1-3)
(Credit to be arranged.) Consent of ins tructor.

## ME 213 -Properties of Materials (4)

Basic properties, behavior, and survey ofengineering and industrial applications of metals, polymers, ceramics, and composites.

Prerequisite:Ch 221. Lecture and laboratory.. Corequisite:ME213L.

## 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 ofdrawings and dimensioning techniques. Other topics include sheetmetal parts modeling, standard library parts, and presentation methods.
Corequisite:ME250L.

ME 250L-Lab for ME 250 (0)
Lab for ME 250.
Corequisite:ME250.
ME 299-Special Studies (1-4)
(Credit to be arranged.)

## ME 304U-Energy and Society (4)

Study ofthe energy problem: a complex societal problem which has a major technical component. Des igned to help nonscience majors understand the technical side 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-divisionstanding..

## 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 discussed.

Prerequisite:ME213 (concurrent enrollment allowed), EAS 212, Mth 261.

## ME 314-Analysis and Design of Machine Elements (4)

Analysis and design of machine elements and systems, covering failure theories, fatigue, fasteners, 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 analysis; and dimensional analysis. Lecture and laboratory. Corequisite:ME320L.

Prerequisite:EAS 215, Mth 256.. Corequisite:ME 320L.
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 223, 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 analys is 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: Mth 256, Mth 261, ME 320, ME 321..
ME 350 - Programming and Numerical Methods (2)

Introduction to programming. Topics include: MATLAB programming; variables, arrays, logical expressions, 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 systemdynamics for single and multiple degree-of-freedomlinear systems. Thecourse 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 BSME program. Includes exposure to topics related to effective and res ponsible practice of mechanical engineering. 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 ins tructor.

## 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 ins tructor.

## ME 405-Reading and Conference (1-6)

(Credit to be arranged.) Consent of ins tructor.

## ME 406-Special Projects (1-6)

(Credit to be arranged.) Consent of ins tructor.

## ME 407-Seminar (1-6)

(Credit to be arranged.) Consent of instructor.

## ME 410 -SelectedTopics (1-6)

(Credit to be arranged.) Consent of ins tructor.

## ME 410L-Special Topics Lab (0)

Special topics lab. Please contact 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
generalmeasurement concepts and instrumentation characteristics. Specific devices for measuring such parameters as dis placement, 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-level credit as ME 511 and may be taken only once for credit. . Prerequisite: ECE 221, senior standing in engineering..
Corequisite: ME411L..

## ME 411L-Engineering Meas urement and Ins trumentation 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 ofmechanical and thermal stresses, electromagnetic fields, irradiation, and chemical environments, surface and related phenomena; examples from metallic, ceramic, polymeric, and composite materials.

Also offered for graduate-level credit as ME 513 and may be taken only once forcredit. . Prerequisite:ME 213..

ME 415 - Advanced Topics in Energy Conversion (4)

Topics chosen for relevancy to current technological practice concerned with energy conversion. 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 ME 515..
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. Cost estimation and economic evaluation. Design optimization.
Also offered for graduate-level credit as ME 520 and may be taken only once for credit. . Prerequisite: ME 320, 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 transmis sion 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 once forcredit. .Prerequisite: ME 323..

## 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 ofenergy-efficient building design. Topics include: heat loss and gain in buildings, heating and cooling load calculations, energy use analys is, day lighting in commercial buildings, energy efficiency, green building technologies, and modeling for energy code compliance. Project in design/simulation.
Also offered for graduate-level credit as ME 522 and may be taken only once for credit..

## 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 res olving mois ture problems. Applications ofcommon 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 measurement, field monitoring, and/or computer simulation.

Also offered for graduate-level credit as ME 523 and may be taken only once forcredit. . Prerequisite: ME 321 or graduate standing in engineering or architecture..

ME 424 -HVAC System Design andControls (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 handlingunits; 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 graduate-level credit as ME 524 and may be taken only once forcredit. . Prerequisite:ME 421/521 and ME351..

## ME 425 - 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 quantifying and characterizing sources, transport, transformation, and control of indoor air pollutants; en ergy conservation and indoor air pollution; quantifying human exposures to air pollutants. Course includes assembly of building sciencesensors 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 graduate-level credit as ME 525 and may be taken only once forcredit..

## ME 426 -Solar Engineering (4)

Overview of solar energy and its applications. Solar resources, solar economics, 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 ME 526 and may be taken only once for credit. . Prerequisite:ME 323..

## ME 427 - Phase Trans formations 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 ofstudy for students in material and mechanical engineering fields.

Also offered for graduate-level credit as ME527 and may be taken only once forcredit.. Prerequisite:
Senior or graduatestanding in Engineering..

## ME 428-Scanning Electron Micros copy 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 graduate-level credit as ME528 and may be taken only once forcredit.. Prerequisite: One year of general engineering or physics or instructor 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 analysis techniques include energy dispersive X-ray 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 acces sories.

Also offered for graduate-level credit as ME 529 and may be taken only once forcredit.. Prerequisite: One year ofgeneral engineering or physics.. Corequisite: ME 429L.

## ME 429L- Trans mission Electron Microscopy and Chemical Analys is of Materials Lab (0)

Corequisite: ME429.

## ME 437-Mechanical Systems Design (4)

Objective of this course is to integratevarious analys is methods in the context of design projects with realistic constraints. Emphas is 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 ME 537 and may be taken only once forcredit. .Prerequisite: ME 240, ME 351, ME 314.

## ME 438-Fundamentals of MEMS and Microsystems (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 microsystems engineering. Case studies involving the design, operation, fabrication
and packaging of MEMS devices will be presented throughout the class.

Also offered for graduate-level credit as ME 538 and may be taken only once forcredit. . Prerequisite: senior or graduate standing.

## ME 443 - Advanced Engineering Thermodynamics (4)

Thermodynamics of physical and chemical systems with eng ineering applications;: bas ic 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 specialtopics: 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 ME 543 and may be taken only once for credit.. Prerequis ite: ME 321..

## 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 thermalmanagement of electronic equipment and theoretical fluid mechanics.

Also offered for graduate-level credit as ME 545 and may be taken only once forcredit.

## ME 446 - Compressible Flow (4)

Introduction to compressible flow (gas dynamics). Isentropic flow in varying area ducts (nozzles, diffusers). Adiabatic flow in constant areaducts with friction. Frictionless flow in constantarea 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, catalytic reactors, drying processes

Also offered for graduate-level credit as ME 547 and may be taken only once for credit. . Prerequisite:ME 323, ME 320, senior or graduate standing..

## ME 448 - Applied Computational Fluid Dynamics (4)

Computational fluid dynamics (CFD) is presented as a designtool for analyzing flow and heat transfer. Algorithms implemented in commercialCFD packages are reviewed. Training in useofa commercial code is provided. Casestudies 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: ME 322 and ME323.

## ME 449 - Thermal Management Measurement (4)

Provides a survey of laboratory-based techniques used to diagnoseelectronic cooling problems, and to obtain design data for developing thermal management solutions. Provides significant practical experience: students design and build their own 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 ofbias error) and uncertainty analysis are used extensively. Lecture and laboratory.

Also offered for graduate-level credit as ME 549 and may be taken only once forcredit. . Prerequisite: ME 323, 411 .

## ME 450 -Solid Modeling (4)

Emphasis is on solid model construction methods using state-of-the-art solid 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 ME 550 and may be taken only once for credit. . Prerequisite: senior or graduate standing in engineering or a closely related field.. Corequisite: ME450L.

ME 450L-Lab for ME 450 (0)
Lab for ME 450.
Corequisite: ME450.

## 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: mathematicalmodeling of control systems; transfer functions and block diagrams; transient response; stability; root-locus method; frequency response method; and control system design techniques. Computer analysis and solution techniques will be utilized.

Also offered for graduate-level credit as ME 552 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 des ign and applications us ing transfer function and state variable approaches. Introduction to digital control systemdesign, including: transfer function and state space formulation, and time and frequency domain analysis techniques. Computer analysis and solution techniques will be utilized.
Also offered for graduate-level credit as ME 553 and may be taken only once for credit. . Prerequisite:ME 452/552..

## 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 ME 554 and may be taken only once for credit. . Prerequisite:ME 452/552..

## ME 455 - Finite Element Modeling and Analysis

 (4)The finite element method as related to the solution of mechanical design problems including thermal stress analysis. 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 ME 555 and may be taken only once forcredit.. Prerequisite: for ME 455: 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, use a microcontroller, and control a motor. The format of the course will be one lecture and one lab perweek.

Also offered for graduate-level credit as ME 556 and may be taken only once for credit.. Prerequisite: ME 351.

## ME 457 - Introduction to Robotics (4)

Robot kinematics dynamics and control; basic components of robots: controllers, power supplies and end effectors; industrial applications of robots us ing peripheral devices, sensors, and vision.
Also offered for graduate-level credit as ME557 and may be taken only once forcredit. . Prerequisite: ME 351..

## ME 458 - Principles Of CNC Machining (4)

A study of principles of machining, tool path generation and analytic geometry, part design and programming, integration ofCAD/CAM software, structure and control of CNC machines, and introduction to computer-integrated-manufacturing. Lecture and laboratory.

Also offered for graduate-level credit as ME 558 and may be taken only once forcredit. . Prerequisite: ME 241 and senior standing in mechanical engineering..

## ME 460 - Control of Mechanical Systems using Microcontrollers Laboratory (4)

Bas ic interfacing and programming of microcontrollers for controls applications is introduced. Microcontrollers are interfaced with various external devices and sensors using $\mathrm{A} / \mathrm{D}, \mathrm{D} / \mathrm{A}$, and the SPI bus. Control of motor driven mechanical device is implemented. A student selected final project involving the control of a physical system is required.
Also offered for graduate-level credit as ME 560 and may be taken only once forcredit. . Prerequisite: ME 453/553 and ME454/554 (concurrent enrollment with ME 460/560 allowed).

ME 461 - Buildings and health: Indoor air quality (4)

We spend $90 \%$ of ourtime ins ide buildings and much of our exposure to air pollution occurs indoors. Students developmass-balance models of pollutant fate, transport, and transformation for indoor spaces including parameterizing indoor sources (emissions), indoor-outdoor transport(ventilation), transformation (removal and chemical reactions), and control strategies for indoor air pollutants. Students solve developed models with analytical and numerical methods. Students use mass-balance models to inform assessment of human exposure to air pollution and infectious disease transmission.

Also offered for graduate-level credit as ME 561 and may be taken only once for credit.. Prerequis ite: ME 320 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 dis crete-time systems.
Also offered for graduate-level credit as ME 563 and may be taken only once for credit. . Prerequisite:ME 453/553..

## 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 element types such as Plate and Shell as well as Gap and Contact will be discussed. Advanced modeling and analys is topics includenonlinearity in stress analys is(including geometric and material nonlinearity), Buckling, Gap/Contact analysis, forced vibration and frequency response, advanced thermal/structural interactions, and mixed element modeling.
Also offered for graduate-level credit as ME 565 and may be taken only once for credit. . Prerequisite:ME 455 or equivalent..

## ME 471 - Process Measurement and Control (4)

Introduction to process controlhardware, software, and interfacing. Lecture topics include: number systems, hardwareconcepts, 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 ME 571 and may be taken only once for credit. . Prerequisite:ME 411/511; 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. Other topics 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: Upperdivision standing..

## ME 475-Joining Processes andDesign (4)

Course covers manual and robotic welding, brazing, and soldering processes as well as rapid and economical cutting methods. W elding design with steel, stainless steel, and aluminum to 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)

Fundamentalmechanisms 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, and others. Ductile, brittle, intergranular, cleavage, quasi-cleavage, and microvoid coalescencemodes of fracture are discussed. Failures in weldments, brazed and soldered joints, castings, bearings, boilers, forgings, pipelines, bridgecomponents, gears, springs, wear components, tools, and dies.

Also offered for graduate-level credit as ME576 and may be taken only once for credit.. Prerequisite: ME 314..

## 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, assembly, sorting, and testing. Topics cover industry overview, technology trends and common engineering practices. Thetopics chosen are aligned with real fabrication facilities and are suitable for engineering and sciencestudents 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 for credit.. Prerequis ite: Senior or graduatestanding in engineering.

## ME 478 - 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, sub-systems, and systems with focus on their integration. Topics include design, properties, materials, interconnections, assembly processes, performance of various packaging systems, thermal management, failure mechanisms and reliability.
Also offered for graduate-level credit as ME578 and may be taken only once for credit. . Prerequisite:ME 313 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 ME 581 and may be taken only once for credit. . Prerequisite:ME 240, ME 491 concurrently..

## ME 488 -Design of Experiments (4)

Presents the methods of planning the datacollection scheme in indus trial experimentation. Topics to be covered are methods ofstatistical inference, randomization, blocking, empirical and mechanistic model building us ing 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 termcase studies.

Prerequisite: ME 240, ME 314, ME 322, ME 351, Wr 327..

## ME 492 -Conceptual Design Project (4)

Application ofdesign methodology to original projects performed by groups of 3 to 5 students under faculty and industrial adviser. Design process will encompass engineering analysis and broader factors such as group organization, interdisciplinary interaction, and communication. The problem definition 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 emphas ized. Lectures, group and class 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. Please contact department for more information.
Corequisite: ME510.

## ME 511 - Engineering Meas urement and Ins trumentation Sys tems (4)

Principles and applications of measurement methods and instrumentation techniques, as used in various engineering disciplines, are studied. Examination of generalmeasurement concepts and instrumentation characteristics. Specific devices for measuring such
parameters as dis placement, 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-level credit as ME 411 and may be taken only once for credit. . Prerequisite: senior standing in engineering.. Corequisite: ME511L.

## ME 511L-Engineering Meas urement and Instrumentation Systems Lab(0)

Lab for Engineering Measurement and Instrumentation Systems.
Corequisite: ME511.

## ME 512 - Advanced Vibrations (4)

Vibration analysis ofsingle and multiple degreeof freedomsystems. Topics include: (1) modeling of linear systems using matrixmethods; (2) modal analys is; (3) general forcing and Fourier series methods; (4) randomand selfexcited 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; equilibrium and non-equilibriummultiphase systems; effects ofmechanical and thermal stresses, electromagnetic fields, irradiation, and chemical environments, surface and related phenomena; examples from metallic, ceramic, polymeric, and composite materials.

Also offered for undergraduate-level credit as ME 413 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 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 undergraduate-level credit as ME 415..

## 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 empowerstudents 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. Cost estimation and economic evaluation. Design optimization.

Also offered for undergraduate-level credit as ME 420 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 ME 421 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 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 analys is, daylighting in commercial buildings, energy efficiency, green building technologies, and modeling for energy code compliance. Project in design/simulation.

Also offered for undergraduate-level credit as ME 422 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 other health and safety is sues, including assessing and resolving moisture 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 measurement, field monitoring, and/or computer simulation.

Also offered for undergraduate-level credit as ME 423 and may be taken only once for credit. . Prerequisite: graduatestanding in eng ineering or architecture..

## ME 524 -HVAC System Design 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 handlingunits; 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 ME 424 and may be taken only once for credit. . Prerequisite:ME421/521 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 quantifying 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 sciencesensors 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 ME 425 and may be taken only once for credit..

## ME 526-Solar Engineering (4)

Overview of solar energy and its applications. Solar resources, solar economics, 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 undergraduate-level credit as ME 426 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
trans formations 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 undergraduate-level credit as ME 427 and may be taken only once for credit.. Prerequisite: Senior or graduate standing in Engineering..

## ME 528 -Scanning Electron Micros copy for Materials and Device Characterization (4)

The study ofthe 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 ME 428 and may be taken only once for credit.. Corequisite: ME 528L.
ME 528L- (0)
Corequisite: ME528.
ME 529 - Trans mission Electron Micros copy 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 analysis techniques include energy dispersive X-ray 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 ME 429 and may be taken only once for credit.. Corequisite: ME 529L.

ME 529L- (0)
Corequisite: ME 529.

## ME 530 -Solid Mechanics (4)

This course provides the knowledge ofmechanics, physics, and mathematics that concerns the behavior of solids under external actions including external forces, applied displacements, temperature changes, mois ture diffusion, etc. Topics include kinematics of deformation and motion, Lagrangian strain tensor, Cauchy stress tensor, elasticity and plasticity.

Also offered as ME 630 and may be taken only once for credit. . Prerequisite: undergraduate mechanics and engineering mathematics; 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 ofturbomachines are discussed.

Prerequisite:ME322, 331.

## ME 537 -Mechanical Systems Design (4)

Objective of this course is to integrate various analys is methods in the context of des ign 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 undergraduate-level credit as ME 437 and may be taken only once for credit.

## ME 538 - Fundamentals of MEMS and Microsystems (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 microsystems engineering. Case studies involving thedesign, operation, fabrication and packaging ofMEMS devices will be presented throughout theclass.

Also offered for undergraduate-level credit as ME 438 and may be taken only once for credit.
Prerequisite:senior or graduate standing..

## ME 541 - Advanced Fluid Mechanics (4)

Partial differentialequations governing the conservation of mass, momentum, and energy of Newtonian fluids are derived. Dimens ional analysis is used to simplify the governing equations and in particular justify the assumption 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 heattransfer. Analytic and numerical
solutions of heat conduction problems. Laminar and turbulentconvective heattransfer.

Also offered as ME 642 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 theiruse; 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 specialtopics: 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 ME 443 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 absenceof 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 as ME 644 and may be taken only once for credit.. Prerequisite: ME 541 (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 thermaland fluid sciences. Each offering of this course focuses on a specific area and is not a survey. Examples include thermalmanagement ofelectronic equipment and theoretical fluid mechanics.

Also offered for undergraduate-level credit as ME 445 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 complex problems in engineering analysis are introduced. The techniques learned will find direct application in
systemmodeling, data reduction, and guidance of complex experimentation and/or testing and 3-D computer modelbenchmarking. Applied mathematical techniques focus on, but are not at all limited to, thermal-fluids sciences.
Also offered as ME 646.. Prerequisite: ME551..

## ME 547-Trans fer 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, catalytic reactors, dry ing processes.
Also offered for undergraduate-level credit as ME 447 and may be taken only once for credit. . Prerequisite: graduatestanding..

## 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 commercialCFD packages are reviewed. Training in useofa 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 ME 448 and may be taken only once for credit. . Prerequisite:ME541/ME641..

## ME 549 - Thermal Management Measurement (4)

Provides a survey of laboratory-based techniques used to diagnoseelectronic cooling problems, and to obtain design data for developing thermal management solutions. Provides significant practical experience: students design and build their own experiments; they take and analyze their own data. Measurements are made with handheld instruments, bench-topins truments, and with computer controlled data acquisition systems. Data reduction techniques involving centering (removal ofbias error) and uncertainty analysis are used extensively. Lecture and laboratory.
Also offered for undergraduate-level credit as ME 449 and may be taken only once for credit. . Prerequisite:ME323, ME 411..

## ME 550 -Solid Modeling (4)

Emphasis is on solid model construction methods using state-of-the-art solid 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 ME 450 and may be taken only once for credit. . Prerequisite: senior or graduate standing in engineering or a closely related field.. Corequisite: ME 550L.

ME 550L-Lab for ME 550 (0)
Lab for ME 550.
Corequisite: ME 550.
ME 551 - Engineering Analysis (4)
Application of mathematical techniques to the solution of controls, dynamics, mechanical, and transport phenomenaproblems. Emphasis given to modeling, physical interpretation, and normalization. Topics include modeling, linear systems, partial differential equations, and complexvariables.

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 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 response method; and control systemdesign techniques. Computer analysis and solution techniques will be utilized.
Also offered for undergraduate-level credit as ME 452 and may be taken only once for credit. . Prerequis ite: upper-division ME undergraduate or graduate student; Mth 256; ECE 221; ME 351. .

## ME 553 - Control Engineering II (4)

Continuous control system des ign and applications using transfer function and state variable approaches. Introduction to digital control systemdesign, including: transfer function and state space formulation, and time and frequency domain analysis techniques. Computer analysis and solution techniques will be utilized.
Also offered for undergraduate-level credit as ME 453 and may be taken only once for credit. . Prerequisite: ME452/552..

## 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 ME 454 and may be taken only once for credit. .
Prerequisite: ME452/552..

## ME 555 - Finite Element Modeling and Analysis

 (4)The finite element method as related to the solution of mechanical design problems including thermal stress analysis. Various element formulations will be discussed, and existing commercial codes will be used to demonstrate modeling and analysis techniques.

Also offered for undergraduate-level credit as ME 455 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 perweek.

Also offered for undergraduate-level credit as ME 456 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 end effectors; industrial applications ofrobots using peripheral devices, sensors, and vision.

Also offered for undergraduate-level credit as ME 457 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 ofCAD/CAM software, structure and control of CNC machines, and introduction to computer-integrated-manufacturing. Lecture and laboratory.

Also offered for undergraduate-level credit as ME 458 and may be taken only once for credit..

## ME 560-Control of Mechanical Sys tems 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 $\mathrm{A} / \mathrm{D}, \mathrm{D} / \mathrm{A}$, and the SPI bus. Control of motor driven
mechanicaldevice is implemented. A student selected final project involving the control of a physical systemis required.

Also offered for undergraduate-level credit as ME 460 and may be taken only once for credit. . Prerequisite: ME453/553 and ME454/554 (concurrent enrollment with ME460/560 allowed)..

ME 561 - Buildings and health: Indoor air quality (4)

We spend $90 \%$ of ourtime ins ide 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 (removal and chemicalreactions), and control strategies for indoor air pollutants. Students solve developed models with analytical and numerical methods. Students use mass-balance models to inform assessment of human exposure to air pollution and infectious disease transmission.

Also offered for undergraduate-level credit as ME 461 and may be taken only once for credit.. Prerequisite: ME 320 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 discrete-time systems.

Also offered for undergraduate-level credit as ME 463 and may be taken only once for credit. .
Prerequisite: ME453/553..

## ME 564-Microgravity \& Capillary Fluid Mechanics II (4)

Advanced principles of capillary phenomena and 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 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 element types such as Plate and Shell as wellas Gap and Contact will be discussed. Advanced modeling and analys is topics includenonlinearity in stress analys is(including geometric and material nonlinearity), Buckling, Gap/Contact analysis, forced vibration and frequency response, advanced thermal/structural interactions, and mixed element modeling.

Also offered for undergraduate-level credit as ME 465 and may be taken only once for credit. . Prerequisite: ME555 or equivalent..

## ME 571-Process Measurement and Control (4)

Introduction to process controlhardware, 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-level credit as ME 471 and may be taken only once for credit. .
Prerequisite: ME411/511; 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-level credit as ME 474 and may be taken only once for credit..

## ME 576-Materials Failure Analysis (4)

Fundamental mechanisms related to failure of metal and alloys used in engineering structures. Mechanis ms 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, 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, bridgecomponents, gears, springs, wear components, tools, and dies.

Also offered for undergraduate-level credit as ME 476 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 wafer manufacturing, thermal processes, photolithography, ion implantation, etch, dielectric thin films, metallization, chemical mechanical polishing, assembly, sorting, and testing. Topics cover industry overview, technology trends and common engineering practices. Thetopics chosen are aligned with real fabrication facilities and are suitable for engineering and sciencestudents who want to be process, manufacturing, or equipment engineers in the semiconductor industry.
Also offered for undergraduate-level credit as ME 477 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, sub-systems, and systems with focus on their integration. Topics includedesign, properties, materials, interconnections, assembly processes, performance of various packaging systems, thermal management, failure mechan isms and reliability.
Also offered for undergraduate-level credit as ME 478 and may be taken only once for credit. .

## ME 580 - Boundary Layers (4)

Presents boundary layers froma laminar and turbulentperspective. Derivation of the boundary layerequations of motion is carried out. Orderof magnitude analysis and similarity solutions are dis cussed. Specific cases of these flows are considered.

Also offered as ME 680.. Prerequisite: ME541 or equivalent.

## ME 581 -Mechanical Tolerancing (4)

Presents the principles of current dimensioning and tolerancing standards including their syntax, meaning, methods of verification, and their relation to design requirements. Statistical techniques for tolerance analysis and synthesis relevant to various as sembly and fit requirements. Other topics include standards of surface roughness, limits and fits, and relevant hardware and software products. A term project on a mechanical part product intended for manufacturing is required.

Also offered for undergraduate-level credit as ME 481 and may be taken only once for credit. .
Prerequisite: ME241, ME 491 concurrently..
ME 588 - Design of Industrial Experiments (4)
Presents thestatisticalbasis of industrial experimentation used in process and design improvement. Topics include model building, randomized and blocked designs, Latin squares, analys is 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 discussed. 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 ins tructor.

## ME 610 -Selected Topics (1-9)

(Credit to be arranged.) Consent of ins tructor.

## ME 612 - Advanced Vibrations (4)

Vibration analysis of single and multiple degreeof freedomsystems. Topics include: (1) modeling of linear systems using matrixmethods; (2) modal analys is; (3) general forcing and Fourier series methods; (4) randomand self excited vibrations; (5) nonlinear vibrations.
Also offered as ME 512 and may be taken only once for credit. .

## ME 630 -Solid Mechanics (4)

This course provides the knowledge ofmechanics, physics, and mathematics that concerns the behavior of solids under externalactions including external forces, applied displacements, temperature changes, mois ture diffus ion, etc. Topics include kinematics of deformation and motion, Lagrangian strain tensor, Cauchy stress tensor, elasticity and plasticity.

Also offered as ME 530 and may be taken only once for credit. .

## ME 632 - Turbomachinery (4)

Application of thermodynamics and fluid mechanics principles to the analysis and design of various types of turbomachinery, including pumps, fans, compres sors, and turbines. An advanced unified treatment is presented. Theory, operation, performance, use, and selection ofturbomachines are discussed.

Prerequisite:ME322, 331..

## ME 641 - Advanced Fluid Mechanics (4)

Partial differentialequations governing the conservation ofmass, momentum, and energy of Newtonian fluids are derived. Dimens ional analysis is used to simplify the governing equations and in particular justify the assumption 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 ME 541 and may be taken only once for credit..

## ME 642 - Advanced Heat Transfer (4)

Advanced treatment of the principles of conductive and convective heattransfer. Analytic and numerical solutions of heat conduction problems. Laminar and turbulent convective heattransfer.
Also offered as ME 542 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 absenceofgravity. 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 ME 544 and may be taken only once for credit.. Prerequisite: ME 641 (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 complex problems in engineering analysis are introduced. The techniques learned will find direct application in systemmodeling, datareduction, and guidance of complex experimentation and/or testing and 3-D computer modelbenchmarking. 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: ME 551..

## ME 651 - Engineering Analysis (4)

Application of mathematical techniques to the solution of controls, dynamics, mechanical, and transport phenomen a problems. Emphasis given to modeling, physical interpretation, and normalization. Topics include modeling, linear systems, partial differential equations, and complexvariables.

Also offered as ME 551 and may be taken only once for 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 analys is. Emphas izes 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 or C, MATLAB and Maple.
Prerequisite: ME352..

## ME 664-Microgravity \& Capillary Fluid Mechanics II (4)

Advanced principles of capillary phenomena and 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 ME 564 and may be taken only once for credit.. Prerequisite: ME644.

## ME 680 - Boundary Layers (4)

Presents boundary layers from a laminar and turbulentperspective. Derivation of the boundary layerequations of motion is carried out. Order of magnitude analysis and similarity solutions are discussed. Specific cases of these flows are considered.

Also offered as ME 580.. Prerequisite: ME641 or equivalent.

## ME 688 - Design of Industrial Experiments (4)

Presents thestatistical basis of industrial experimentation used in process and design improvement. Topics include model building, randomized and blocked designs, Latin squares, analys is 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 discussed. The cours einvolves 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 personal 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 studentsuccess in the School of Bus iness 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 resources, 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 mission. 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 dynamics, 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 performancemanagement, including human resource planning/job design, selection and staffing, training and development, compensation, performance appraisal, and employee
and laborrelations. Also examines legalquestions which affect human res ource 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 long-termgoals for sustainable profitability and to train students in crossfunctional innovation process leadership.

## Mgmt 399-Special Studies (1-6)

(Credit to be arranged.)

## Mgmt 399U-Special Studies (4)

(Credit to be arranged.)

## Mgmt 401 -Res earch (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 -SelectedTopics (0-6)

(Credit to be arranged.)

## Mgmt 421 -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 apply ing course assignments to their own idea for a new social venture (nonprofit, social enterprise, or sustainable business), or to an existing social venture of theirchoice.

Also offered for graduate-level credit as Mgmt 521 and Mgmt 521S, and may be taken only once for credit.. Prerequis ite: Sophomore standing or higher, competitive PSU or trans fer GPA ( 3.0 or higher with consideration made for specialcircumstances), and satis factory completion of short application..

## Mgmt $\mathbf{4 2 2}$ - 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 statup and customer development methodologies, develop a revenue model, explore nonprofit and business legal entities, and create financial forecasts. Students will apply course assignments to their own idea for a new social venture, orto 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 or higher, competitive PSU or trans fer 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 and utilize effective personal 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, socialenterprise, 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 teamsettings. The influence of member pers onality and attributes on teamwork, motivating teammembers, developing effectiveteam processes, and constructive conflict management and team communication are some of the issues that may be addressed. Also focuses on the development and use of a variety of teams prevalent in contemporary organizations and some ofthe 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 leasing 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 hous ing laws, key components of a maintenance plan, and fundamental marketing tools and analysis for multifamily properties.

Also offered for graduate-level credit as RE 532 and may be taken only once forcredit.. 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 es tate 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 graduate-level credit as RE533 and may be taken only once forcredit.. Prerequisite: BA 332U.

## Mgmt 441 - Collective Bargaining and Labor Negotiations (4)

Workshop giving students hands-on experience negotiating individual and group contracts. Students will learn how to manage the employment relationship within a union environment, studying: the legal environment of unions; negotiations theory and practice; and grievanceresolution procedures. Students will devote significant time in class to negotiating individual and group contracts, and will have ample opportunity to receive feedback to improve their skills.

Prerequisite: BA 302.

## Mgmt 442 - Human Res ources Information Systems \& People Analytics (4)

FundamentalHR 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 analys is and visualization; data security and privacy; and data-related ethical and legal is sues.
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 ofdynamic environments, innovation, and technology for organizational structure, design, and processes. Management of change froma multilevel pers pective 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 inves tments, and international operations. In addition, the political, economic, and cultural environments of international business are examined from the perspective of management. Comparative management is also treated through the study ofother 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 souland spirit into working environments; and methods fordeveloping sensitivity and appreciation for this dynamic 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 analys is 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 561S 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 Iss ues (4)
Inves tigation of the ideas of what constitutes "effective leadership" as organizations enter the 21st century. Various aspects of the new leadership paradigmare addressed. Students will develop an awareness of theirpersonal leadership profile and capabilities and the is sues they will face as leaders in tomorrow's organizations.

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, 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 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 HRMoption students..

## Mgmt 481 - Entrepreneurship(4)

This course focuses on the entrepreneurial practices and tools fordevelopment 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 analys is, feas ibility, business planning development and competition.
Prerequisite: admis sionto SBA..

## Mgmt 485 - Career Management and Digital Portfolio (2)

Integrates learning fromacross the business program and 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 personalized review of course and programgoals. Co-requisite: BA 495.
Prerequisite: BA 301, BA 302, BA 303, BA 311, BA 325, BA 339, and BA 385.. Corequisite: 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; career stages, paths, planning; retraining outdated workers; outplacement, evaluation of training effectiveness; long-term 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. . Prerequisite: Prior completion of Mgmt 351. Preference on waiting list will be given to HRMoption students..

## Mgmt 493 - Human Res ource Strategy (4)

This is the final course in the Human Resource Managementsequence. Uses case analysis, outside speakers, and a comprehensive project to provide an in-depth, analytical study of fhuman resource management and the tasks of the modern human res ourceexecutive. Focuses on transforming the HRM function for the modern corporation. Emphas izes 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, 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 ins tructor.

## 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 (1-8)

(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 business models. Theseare the key contributors to a successfulstrategy. 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 organizational behavior, leadership, and human resource factors that contribute to long termvalue creation for the organization. Leadership emphasizes the creation and maintenance of relationships with key internal stakeholders as part of building organizational effectiveness, social res ponsibility and environmental stewardship into organizational systems. Organizations are studied fromthree perspectives: the individual, the work team, and the organizational 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 Stewards hip (4)

The course is designed to providestudents with an understanding of how political, social, legal, regulatory, and environmental is sues impact business organizations within a global context. Topics covered include legal issues and compliance environments, 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 providestrateg ic direction to organizations. Both business-level and corporatelevel 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 res ponsibility 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, $I T$ 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 res ponsibility for social and environmental impacts associated 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 advantage in negotiation in the context of a work environment where positiveon-going relationships are essential. It explores the major theories and concepts of the field, giving students the chance to practice deal making and conflict res olution through participation in negotiation exercises.

## Mgmt 518 -Digital Transformation of Business (4)

In every industry, the adoption ofdigital 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 trans formation strategies to respond effectively.

## Mgmt 519-Digital Trans formation: 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 transform
business functions and frameworks for managing cybersecurity and privacy. The course concludes with a review of ethics in the digitaleconomy. Students will study various casestudies 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 their own unique work environments and career aspirations. This will lead to an increased ability to formulate strategic recommendations and propose alternative actions fordesigning digital transformation journeys. A leadership development plan will prepare students to adapt organizational 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 idea for a new social venture (nonprofit, social enterprise, or sustainable business), orto an existing social venture of theirchoice.

Also offered for undergraduate-level credit as Mgmt 421 and may be taken only once for credit.. CrossListed as:This is the same course as Mgmt 521S and may be taken only once forcredit..

## 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), orto an existing social venture of theirchoice.

Also offered for undergraduate-level credit as Mgmt 421 and may be taken only once for credit.. CrossListed as: This is the same course as Mgmt 521 and may be taken only once forcredit..

## Mgmt 522S -Money Matters for Social Innovation (4)

Developing an effective financial model is essential for any socialventure, whether a nonprofit, social enterprise, or sustainable business. Apply lean startup and customer development methodologies, develop a revenue model, explore nonprofit and business legal entities, and create financial forecasts. Students will apply course assignments to their own idea for a new social venture, orto an existing social venture of their choice.

Also offered for undergraduate-level credit 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 measurement is a key element for successful social inno vation. Learn and utilize effective personal and organizational 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 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, investors, and customers; understand venture types and their lifecycles 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 bestpractices and unsuccessful practices. Case study analysis and use of current events will illustrate these practices. Pays particular attention to value creation.

Prerequisite:MBA or MSFA admission..

## Mgmt 540-HR Analytics Rapid Evidence Assessments (2)

Learn the skills necessary to leverage existing research and evidence in order to produce key HR questions 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 resource (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 datamanagement 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 answer key questions. The coursecontinues the focus on information systems, ethics, and visualizations, with an emphasis 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 theadvantages and disadvantages of different applications, and how to develop effective 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 infras tructure, technology strategy, res earch and development, theroles of invention, innovation, research and development, product development, and other critical technology related topics. Coverage will also be given to is sues 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 includetechnical professional performance and productivity, high performing technicalteams, 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 assessment, international strategy, structuring and controlling the multinational enterprise, international negotiations, and international human resource management. Course is targeted both toward managers who work abroad as well as those dealing with international business fromthe 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 business; strategies for injecting more soul and spirit into working environments; and methods for developing sensitivity and appreciation for this dynamic 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 Storytelling 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 fromtheir predecessors. Focuses on the daily strategies of generalis ts as they lead their subordinates to high long-termproductivity. Studies allaspects of the employee life cycle from selection through separation, including employee development, reward systems, performance management, and employee relations. Emphas is on problemsolving 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 froma beginner to an intermediate levelof proficiency in key HR analytical tools and strategies. Emphasis is placed on integrating data analytic approaches culminating in a term-long project.

## Mgmt 553 - HR Data Vis ualization and Storytelling (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 datawill focus on assembling key data analytics 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 resolving 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 managementrelationships, purchase agreements, organizational goal setting, etc.

Prerequisite: Mgmt 512..

## Mgmt 554S - Negotiation and Conflict Res olution (3)

Examines negotiation as a sometimes rational, sometimes irrational social process used for resolving 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 includelabor management relationships, purchase agreements, organizational 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 organization intervention techniques. Special issues such as ethics in client-consultant relationships will be integrated intoclass activities.
Prerequisite: Mgmt 512..

## Mgmt 556-Organizational Politics andPower (4)

Incorporates theoretical and practical aspects of success in organizations. 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 poweruse.

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 analys is data forms the information base for both compensation and performance appraisal processes. Includes an analytic study of traditional and evolving methods ofcompensation 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 561S 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 analys is 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 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-Lis ted as:This is the same course as Mgmt 561 and may be taken only once for credit.

## Mgmt 562 - Business Strategy Caps tone (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 judgmentnecessary to provideoverall direction to the organization. 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 ofemployees to achieve the strategic human resource goals of the organization. Topics covered include staffing strategies, human resourceplanning, 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 for credit.. Prerequisite:Priorcompletion of or concurrent registration in Mgmt 512. Preference on waiting list will be given to HRM-option students.. Cross-Lis ted as:This is the same course as Mgmt 571S and may be taken only once for credit..

## Mgmt 571S -S taffing 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 resourceplanning, 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 for credit. .
Prerequisite: Prior completion of or concurrent registration in Mgmt 512. Preference on waiting list will be given to HRM-option students.. Cross-Lis ted
as: This is the same course as Mgmt 571 and may be taken only once for credit..

## 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; long-term 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 analysis; the nature, types and methods of training; career stages, paths, planning; retraining outdated workers; outplacement, evaluation of training effectiveness; long-term 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 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 Ecos ystem Services (4)

Evaluates changing ecosystemservices in a holistic way, drawing multiple disciplines, including ecology, economics, engineering, and geographical and spatial sciences. Introduces methods and models from multiple disciplines to analyze ecosystemservices across biophysical, social, economic, and cultural contexts. Provides an interdisciplinary foundation for evaluatingecosystemservices.

## Mgmt 698 - Ecos ystemServices Valuation: An Integrated Ass essment (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 same course as Ec 698; may only be taken once for credit.

Prerequisite: ESR 692, Soc 694 and Geog 696 or instructor's permis sion.. 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 (19)
(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 Age of the Pacific Series or an elective course addressing contemporary business issues in international business.

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 internationalbusiness.

## 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 team leading across borders and organizations, 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 Rim Economies, Trade, and Financial Markets (3)
The cours e surveys 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 cours e covers global managerial and cost accounting is sues; it also focuses on the useof accounting information with in the multinational firm. In addition, the course will cons ider 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 analys is, and inventory valuation.

## MIM 515-Global Contemporary Marketing (4)

The global/international marketing strategies and operations ofmultinational corporations (MNCs) are studied through as sessment 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 is sues, 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 issues 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 ofMNCs, includingperformance 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 informand persuade across cultures through speaking, writing, and listening. Topics include reading, internalizing fundamentalconcepts, 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 globalenvironment. Topics to be reviewed include; locating and qualifying international suppliers, the strategies regarding outsourcing/ offshoring, 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 ofnon-verbal communication. Analysis ofsuccessfuladaptationto 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 selfawareness. 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 ofnon-verbal communication. Analysis ofsuccessful 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 selfawareness. This is the second course in a sequence of two: MIM 527 and MIM 528.

## MIM 531 -Product Design andS tewardship for Sus tainable 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 waste and generate value. Addresses the principles of industrial ecology, environmental management systems, product stewardship and life cycle analysis, 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 transportation. Topics such as liner conferences and air freight will be included.

## MIM 535-Global Marketing Res earch and Innovation (3)

This course concentrates on how 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 Entrepreneurs hip (4)

This introductory course will apply the concepts of social entrepreneurship and social enterprise as a forprofit 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. Working with a client company, they will investigate a pressing business problemand providerecommendations; alternatively students will develop a 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 all of the concepts contained within the previous threeclasses. 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. Emphasis 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 ofeffective selling
skills in a business-to-business environment and an understanding of effective sales management strategies and activities. The integration ofsales automation technology ande-business will be discussed.

## MIM 551 -Managing and Leading International Non-Governmental Organizations (4)

Introductionto 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 organization, the external environment, and organizational 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 environment in 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 fromnew 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 appraisal, 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-disadvantaged international communities. Methods of engagement between international non-governmental organizations, corporations, and communities to further their respective and mutual objectives are addressed. Recommended prerequis ite: MIM 511.

## MIM 564 - Global Human Res ource Management (4)

Examines the management of human res ources in the international firm, including motivating and leading employees in multi-cultural contexts. Course begins with an analys is 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 corporateculture, HR support for organizational learning and approaches to human resource management transfer across borders, are also studied. Also examines the nature of successful cross-cultural 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 fromthoseinvestments. Positions these is sues in the context of the particular challenges 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 emphas is placed on understanding traditional cost systems, activity-based costing systems, cost management in global supply chains and determining the cost of quality. Relies heavily on the examination of actual global company 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 perspective of chieffinancial and accounting officers, investors and creditors; development of models for determining and forecasting the profitability and financial position of the global firm. Bus iness valuation techniques, emphasizing cash flow projections. Some is sues in costs and risk management. Theoretical principles and practical approaches of valuation of a global businessor business interest, including valuation strategies for specific purposes such as mergers,
acquisitions, and corporate restructuring, multi-SBU 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 from the previous specialization cours ework. Case analyses are used to enhance analytical and quantitative skills applied to real-world situations. All case work focuses on companies having internationaloperations, with particular emphas is 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 costofcapital 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 otherPacific 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 and techniques of negotiation, influencing, and dispute resolution for forging mutually profitable business relationships, enhancing teamcohesion, and establishing sustainable international partnerships. The course makes extensive useofnegotiation role plays, out-ofclass exercises, and panels by experienced negotiators.

## MIM 579-Asia Field Study (4)

Students travel to As ia to visit companies, meet with businessexecutives, and learn more about business 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 cours e will analyze business strategy as both a long-termplan 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 forboth industrial and retail professionalsales with an emphasis on the sales process including prospecting, approaching, presenting, negotiating, closing and follow-up. Topics include sales careers, sales strategies and tactics, buyer behavior 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 cours ework, students practice sales skills in role plays, presentations and other exercises 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 advertis ing is sues and strategies. Course focuses on concepts, principles, processes, terminology, trends, and techniques which shape this constantly changing field including the impact of technology on mes sage delivery.

## 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-Cons umer 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-term relationships. 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, wholesale, 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 405-Reading and Conference (0-6)

(Credit to be arranged.) Consent of ins tructor.

## Mktg 407-Seminar (1-6)

(Credit to be arranged.) Student-selected problems in businessoperation and business management to be studied by the individual and dis cussed in group meeting underdirection of academic staff.

## Mktg 409-Practicum(1-12)

(Credit to be arranged.) Field work involving the practice of professional activities away fromcampus.
Prerequisite: consent of ins tructor..

## Mktg 410 - Selected Topics (1-8)

(Credit to be arranged.)

## Mktg 435-Consumer Pack age Goods Marketing

 (4)Examines marketing distribution systems used by food and consumer package goods (CPG) companies. Emphasis on describing CPGindustry value chains and how business environmental factors impact the creation, delivery, and capture of customer valueby different industry participants. Examines the marketing relationships between manufacturers, wholes alers, brokers, retailers, and consumers. Topics include ECR, category management, Efficient Replenishment, retail trends in buyerbehavior, 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 distinctivechallenges 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, merchandising, 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 Schoolof Business thatoffers experience in development and execution of advertis ing, brand and communication strategy to solve business problems faced by community-based businesses and organizations. Requirements: Application and acceptance plus a minimum of 2 and a maximum of 3 terms in FIR NW. Open to students outside the businessschool. 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, quantitative decision making, and media planning and negotiating techniques. This course is dataintensive 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 messages, techniques for writing and designing advertisements, and the unique requirements of different types of creative messages. Also includes creative considerations for specific media including those driven by technology.

Prerequisite:Mktg 340U.

## Mktg 443 - Advertising Campaigns (4)

Emphas is is on the development of total advertising campaign froma marketing pers pective. 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 as signments, 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 advertis ing agency and develop a national campaign for a national brand company. Campaign development focuses on res earch, creative strategy, the media plan, ad production, integration of promotional and interactive components, presentation, and budgeting. This is the first course in a sequence ofthree: 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 advertis ing agency and develop a national campaign for a national brand company. Campaign development focuses on res earch, 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 advertis ing agency and develop a national campaign for a national brand company. Campaign development focuses on res earch, creative strategy, the media plan, ad production, integration of promotional and interactive components, presentation, and budgeting. This is the third course in a sequenceof 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 emphas is 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 assess online customer behavior (i.e. website traffic, click-through rates, conversion rates), to evaluate multi-digital channel performance, and to serve as the basis for as sessing 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 assess 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 Internethas changed the rules of product development by erasing competitive barriers and emphasizing rapid development cycles. The class will focus on identifying new product opportunities, rapid innovation procedures, the management of the development process, and alignment with emarketing 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, dis tribution, and promotion in the creation of competitive market strategies.

Prerequisite: BA 311.

## Mktg 455 - Technology Mark eting (4)

Survey of Internet-based marketing strategies with special focus on the W eb in business-to business and business-to-consumersituations. 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, developing e-products, creating the customer interface, e-pricing, e-branding, and e-positioning strategies. Additional emphas is is on creating and leveraging a strategic Web presence with portals, partnerships, community building, and permis sion-based marketing.
Also offered for graduate-level credit as Mktg 555 and may be taken only once for credit.. Prerequisite: BA 311.

## Mktg 460 - Marketing Res earch (4)

Studies the planning, data collection, analysis, and reporting issues relating to marketing research. Key is sues 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 issues in a business world that is being transformed by widespread adoption of the Internet and related technologies. Topics include customer relationship management, effects of Internet on product-related 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 fundamentalmarketing analytic 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 advertis ements) or in-store. This course will emphasize the analysis and modeling ofcustomer 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. . Prerequisite: BA 311 and BA 325..

## Mktg 463 -Service Innovation (4)

This course is focused on the issues that confront marketing managers as they address the development of innovativeservices and service-oriented marketing strategies. It will cover new service design and development, standards, strategy, delivery, and service management with special attention to the technology-enablementof service business models.
Prerequisite: BA 311.

## Mktg 464 -Marketing Strategy and Management (4)

Capstone 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 ebusinessenvironment.

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, transportation 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 ebusinessstrategy.

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 InformationSystems. Marketing Models. Export Planning forExecutives. Sales Force Management.

## Mktg 509-Practicum (1-9)

(Credit to be arranged.) Field work involving the practice of professional activities away fromcampus.
Prerequisite: consent of instructor..

## Mktg 510 -SelectedTopics (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 organizations 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 distributionstrategies, 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 globaleconomy. Consideration of the customer and the customer/firminterface is emphasized. Additionally the course will include methods for fostering the creative process.

## Mktg 514 -Selling andSales Leadership(4)

Students will study selling as a key component of an organization'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 issues in recruiting, training, motivating and compensating a sales force. We will focus on business-to-business selling butmuch of what we learn could be applied to a business-to-business-toconsumer 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. Course emphasizes 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. Emphas is on describing CPGindustry value chains and how business environmental factors impact the creation, delivery, and capture of customer valueby different industry participants. Examines the marketing relationships between manufacturers, wholes alers, brokers, retailers, and consumers. Topics include ECR, category management, Efficient Replenishment, retail trends in buyerbehavior, 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.. CrossListed 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 CPGindustry valuechains and how business environmental factors impact the creation, delivery, and capture of customer valueby different industry participants. Examines the marketing relationships between manufacturers, wholes alers, brokers, retailers, and consumers. 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 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 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. . CrossListed as: This is the same course as Mktg 536S and may be taken only once forcredit..

Mktg 536S -Athletic and Outdoor Marketing (4)
Understand the distinctivechallenges and ins ights of the active and outdoor industry. Examine the unique business practices of both manufacturers and retailers in this industry. Study such issues 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. . Prerequisite: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 project experience of ideating, creating,
producing, merchandising, marketing and delivering a product to market.

Also offered for undergraduate-level credit as Mktg 437 and may be taken only once for credit.. CrossListed 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 project experience of ideating, creating, producing, merchandising, marketing and delivering a product to market.

Also offered for undergraduate-level credit 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. Courseexplores application of competitive and technological influences on buyers behavior and marketing strategy. Emphas is 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 advantage(s) as sociated with distribution strategies. Explores trends in channel des ign, 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 oftools, 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 for effective and efficient management ofmarketing 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 service offerings. eService relationships will be examined within a customer loyalty framework that cons iders customer value, switching costs, and online relational bonds as key drivers of loyalty.

## Mktg 555 - Technology Mark eting (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 distribution. 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 for credit..

## Mktg 560 - Research for Marketing 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 and qualitative research projects to obtain information frominternal and external business environments. Considers the evaluation and appropriate useof information, information sources and res earch services.
Prerequisite:ISQA 511..

## Mktg 561 - eMarketing (4)

Examines important marketing issues in a business world that is being transformed by widespread adoption of the Internet and related technologies. Topics include customer relationship management, effects of Internet on product- related 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.. CrossListed as: This is the same course as Mktg 561S and may be taken only once for credit..

## Mktg 561S - eMarketing (4)

Examines important marketing issues in a business world that is being transformed by widespread adoption of the Internet and related technologies. Topics include customer relationship management, effects of Internet on product-related is sues (such as brand ing 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. .
Prerequisite: BA 311. Cross-Listed as: This is the same course as Mktg 561 and may be taken only once for credit..

## Mktg 562S -Marketing Analytics (4)

Designed to introduce fundamentalmarketing 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 advertis ements) or instore. This course will emphas ize the analysis and modeling ofcustomer information as a means of building andmanaging 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 Marketing Management (4)

Examines and provides a framework forstudy 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 global environment. Also examines the management of international, multinational and globalmarketing 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. Specialattention 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 (112)

(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)

Discus sion and application of techniques for materials scientists including image analysis, thermal-physical analyses, fracture, and weldability testing. Lecture and laboratory.
Prerequisite: graduatestanding..

## 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 polymerdiffusion.
Prerequisite: Mth261, 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 BEKNOW -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 bas ic 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 lens atic compass and terrain association. Includes practical exercises.

## MS 212 -Leaders hip and Management (2)

Introduction to fundamental leadership and management including problem analysis, decisionmaking, 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 small group leadership techniques.

## MS 215-Fundamentals of Military Science (3)

Contact department for 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 department for a description of this course.

## MS 222 - Basic LeadershipLab (1)

Contact department for 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 department for a description of this course.

## MS 232 - Basic Physical Fitness (1)

Contact department for a description of this course.

## MS 233 - Basic Physical Fitness (1)

Contact department for a description of this course.

MS 240-OCS Phase I-Summer (2)
Contact department for 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 War I.

## MS 310 - American Military His tory (3)

The course builds on the introduction to American Military History covering World War I to the Global W ar on Terror. Recommended prerequisite MS 309

## MS 311 -Military Leadership (3)

This course studies Army Command and Control along with smallunit leadership fundamentals. The Junior Officer's role and responsibilities in the leadership process are fully examined.

## MS 312-Military Operations (3)

The coursestudies 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 smallunit 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 department for a description of this course.

## MS 332 - Advanced Physical Fitness (1)

Contact department for a description of this course.

## MS 333 - Advanced Physical Fitness (1)

Contact department for 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 course studies both the Army's training philos ophy 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 ofmilitary instruction.

## MS 412 - Military Law and Administration (4)

The course focuses on Military Justice, Army Pers onnel Management, and Army Log istics and Supply. Students study the Junior Officer's role and responsibilities in military law enforcement, officer and enlisted 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 commiss ioning in the Army National Guard, Reserves or ActiveDuty. 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 professionaldevelopment.

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 Leadership Lab (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 -Selected Topics (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 taxresearch tools; legal and professional rules governing tax practitioners.

## 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, belowmarket interest, and original is suedis count; claimof right and taxbenefit rules.

## MTax 527-Corporate Taxation I (4)

Taxation of corporate operations, including 1551 and 1561; trans actions between corporations and their shareholders, including transfers to corporations, dividends and other nonliquidating distributions; corporate liquidations.

## MTax 528-Corporate Taxation II (4)

Continuation of MTax 527 , including $S$ corps; judicial doctrines such as substance over form, businesspurpose, step transactions and 7701(o); corporatereorganizations, acquisitions, divisions and liquidations of subsidiary corporations; carryover of tax attributes; consolidated returns; alternative minimum tax; penalty taxes and anti-abuse provisions.
Prerequisite: MTax527.

## MTax 529-Federal Tax Procedure (2)

Reporting requirements; audits; appeals function; assessment procedures; taxlitigation, particularly in the U.S. Tax Court; collections and spousal relief; penalties.

Prerequis ite: Admis sion 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 cost recovery methods; gain or loss realized and recognized on disposition; applicable tax rates; 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 under Subchapter K, such as LLCs; capitalization; determination of taxable income, allocation of taxitems; loss limitations; distributions; 754 elections; recourse and nonrecourse liabilities; disposition of interests; dissolution.

## MTax 532 -Pass-through Entities II (2)

Continuation of MTax 531, including anti-abuse rules, self-employment tax, at-risk and passive loss limitations, "hot as sets," transactions between owners
and entity; dis tributions 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 fromcorporate activities according to ASC 740, including computation of tax expense or benefit, temporary differences, computation of deferred tax assets 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 anduse 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 res idents 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 issues. Students work in teams, coached by experienced tax professionals, to develop solutions which will be deliverable to a hypothetical client 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 real estate transactions; basic sales structures, deeds, titles, financing arrangements, closings; remedies and foreclosure; federal tax provisions applicable to both residential and commercial transactions, including non-recognition 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)

Federal estate, gift and generation-skipping tax laws; his tory 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 orentity taxdepartment; provides opportunity to apply programcontentto real-world environments, 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 taxcareer, and some niche taxpractice opportunities through live and interactive access to leading regional tax profes sionals speaking about their careers and areas of expertise.

## Mth - Mathematical Sciences

## Mth 095-Intermediate Algebra (4)

Topics include problemsolving, linear equations, systems of equations, polynomials and factoring techniques, rational expressions, radicals and exponents, quadratic equations. Credit for enrollment (eligibility) but not toward graduation; satisfies 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 neces sary 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 mathematical topics. Topics may include the mathematics of voting systems, graphs and networks, 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 neces sary 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 sequenceof 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 neces sary 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 oftwo: 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 juniorand senior-level mathematics. Required field work cons ists of providing tutoring service in the community or University. This is the first course in a sequence ofthree: 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 juniorand 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 juniorand 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 problemsolving. This is the first course in a sequence of three: Mth 211, Mth 212, and Mth 213.

Prerequisite: Completion ofMth 95 with a grade of C- or above within the last year, or passing at the neces sary level on the mathematics placement test with in the last year (see Math Department webpage at mth.pdx.edu for information). .

## Mth 212 - Foundations Of Elementary Mathematics II (4)

A constructivist approach to fundamental ideas of mathematics for prospective K-8 teachers. Topics include rational numbers, probability, and statistics. This is the second course in a sequenceof three: Mth 211, Mth 212, and Mth 213.
Prerequisite: Mth 211..

## Mth 213 - Foundations Of Elementary Mathematics III (4)

A constructivist approach to fundamental ideas of mathematics for prospective K-8 teachers. Topics include algebra, geometry, and measurement. This is the third course in a sequence of three: Mth 211, Mth 212, and Mth 213.

Prerequisite: Mth 211..

## Mth 231 - Data Science Seminar (2)

Introduction to data science presented in the form of lectures by the instructor as well as guestlectures from local industry experts illustrating the potential of data science in terms of success stories in various application areas ofscience, engineering, medicine
and finance. The presented examples will describe the kind of mathematical, statistical, and computer science skills needed for 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 last year
(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 Fundamental Theoremof 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 for Mth 261.

## Mth 271 -Mathematical Computing (4)

Machine representation of the real number field and its consequences. Elements oferror analysis. Introduction to the design, analysis, and stability of algorithms. Well/ill-conditioned 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 Reas oning (4)

Fundamental abstract concepts 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 emphas is 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: Mth253..

## 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. Uniform convergence. Power series. This is the second course in a sequence oftwo: Mth 311, Mth 312 and must be taken in sequence.

Prerequisite: Mth311..
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 advection equation, wave equation, initial and boundary value problems, method of fharacteristics, separation of variables.

Prerequisite: Mth256..
Mth 324 -Vector Analysis (4)
Modern vector methods with applications for students ofmathematics, physics, and engineering.

Prerequisite: Mth254..

## Mth 338-Modern College Geometry (4)

Topics in Euclidean and non-Euclidean geometry.
Prerequisite: Mth252, Mth 261 ..
Mth 343 -Applied Linear Algebra (4)
Topics in matrix algebra, determinants, systems of linear equations, eigenvalues, eigenvectors, and linear transformations. Selected applications from science, 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, polynomialrings. The development of the real numbersystem.

Prerequisite: Mth 344..

## Mth 346 -Number Theory (4)

A presentation of the properties of numbers as found in the theory of div is ibility, congruence, diophantine equations, continued fractions, and algebraic numbers.

Prerequisite: Mth252, Mth 261..
Mth 356 -Discrete Mathematics (4)
Topics in discrete mathematics, including propositional logic, sets, relations, inverse functions, divis ibility, induction, recurrences, inclusionexclusion, 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. Spectral clustering, weighted graph matching, and modularity optimization. Gradient descent methods accelerated by coarse models for solving large-scale 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 (112)
(Credit to be arranged.)

Mth 405-Reading and Conference (1-6)
(Credit to be arranged.) Consent of instructor.

## Mth 407-Seminar (1-6)

(Credit to be arranged.) Consent of instructor.

## Mth 410-SelectedTopics (1-6)

(Credit to be arranged.) Consent of ins tructor.

## Mth 411 -Introduction to Real Analysis I (3)

Analysis on metric spaces, Baire Category, ContractionMapping, 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 $\mathbf{4 1 2}$-Introduction to Real Analysis II (3)
Lebesgue measure 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.

Also offered for graduate-level credit as Mth 512 and may be taken only once forcredit. . 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.

Also offered for graduate-level credit as Mth 513 and may be taken only once forcredit. .Prerequisite:Mth 412..

## Mth $\mathbf{4 2 0}$-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 nonpoly nomial 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 forsystems. 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 forcredit. . Prerequisite: Mth 256 and Mth 312..

## Mth 422 -Theory of Ordinary Differential Equations II (3)

Nonlinear systems. Equilibria and localstability. 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. Horseshoes. Symbolic dynamics and the shift map. Discrete dynamics. 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.

Also offered for graduate-level credit as Mth 523 and may be taken only once forcredit. .Prerequisite: Mth 422..

Mth 424-Elementary Differential Geometry I (3)
Differential geometry of curves andsurfaces: 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 $\mathbf{4 2 5}$-Elementary Differential Geometry II (3)

Surfaces of constant curvature, the Gauss-Bonnet theorem; spherical and hyperbolic geometry, elementary Riemannian geometry applications from mechanics and field theory. This is the second 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 525 and may be taken only once forcredit. .Prerequisite: Mth 424..

Mth 427-Partial Differential Equations I (3)
Solution techniques, qualitative analysis and applications: separation of variables, eigenfunction expansion, Fourier series solutions, Sturm-Liouville problems. This is the first course in a sequence of two: Mth 427 and Mth 428 which must be taken in sequence. Prior knowledge of PDEs (Mth 322) is recommended, butnotrequired.

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 dimens ional equations, heat conduction in a disk, vibrating membrane, spherical problems, Bessel and Legendrefunctions, Green's functions, Fredholm alternative. Infinite domain problems, Fourier transformsolutions, finite difference methods. This is the second course in a sequenceoftwo: 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 purposedefinition, and model validation. Models will be chosen from life, the physical and social sciences. Applications chosen from differential 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, nonEuclidean 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, nonEuclidean 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 departmentalapproval, 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, nonEuclidean 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 forcredit.

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 wellordered sets, Cardinal and 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.
Also 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 sequenceof 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 for credit. . Prerequisite: Mth 435..

## Mth 441 - Introduction to Abs tract Algebra I (3)

Group theory and homomorphism theorems. This is the first 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 541 and may be taken only once forcredit. . Prerequisite: Mth 344..

Mth 442 - Introduction to Abstract Algebra II (3)
The theory ofrings, modules, and fields. This is the second 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 542 and may be taken only once for credit. . 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 Galo is theory. This is thethird 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 forcredit. . Prerequisite: Mth 442.

## Mth 444-Advanced Linear/Multilinear Algebra I (3)

Vectorspaces, 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: Mth344..

## Mth 445-Advanced Linear/Multilinear Algebra

 II (3)Multilinear maps, tensor products, exterior algebra. Finite dimensional spectraltheory. 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.. Prerequisite: 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 forcredit. . 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 ofdifferential 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 forcredit. . Prerequisite: knowledge of a programming language such as MATLAB or C/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 linear equation systems. Eigenvalue problem, least square, Chebyshev, trigonometric and rational function approximation. Numerical solution ofdifferential equations. This is the second course in a sequenceof 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 C/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 linear equation systems. Eigenvalue problem, least square, Chebyshev, trigonometric and rational function approximation. Numerical solution ofdifferential 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 C/C++, Mth 253 and Mth 261..

## Mth 456 - Topics in Combinatorics (3)

Selected topics from: permutations, combinations, partitions, generating functions, inclusion/exclusion, recursion, Polya counting, 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: combinatorialand 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 forcredit. . Prerequisite: M th 261 and/or Stat 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 sequence of 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, is omorphisms, 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 for credit. . 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 oftwo: 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 for credit. . 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 trust-region methods. Gradient descent, conjugate gradient, Newton and quasi-Newton methods, nonlinear least-squares problems, GaussNewton and Levenberg-Marquardtmethods, practical applications. This is the first course in a sequenceof two: Mth 464 and Mth 465 . Expected preparation: knowledge of a high-level programming language such as MATLAB, Python, R, or $\mathrm{C} / \mathrm{C}++$.

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 once forcredit.. Prerequisite: Mth 464.

## Mth 470 - Complex Analysis and Boundary Value Problems I (3)

Fundamental concepts of complexanalys is. 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.
Also offered for graduate-level credit as Mth 570 and may be taken only once forcredit. . Prerequisite: Mth 254 and either Mth 256 or Mth 421..

## Mth 471 - Complex Analysis and Boundary Value Problems II (3)

Fundamental concepts of complexanalys is. Calculus of residues and applications. Conformalmappings. Zero-Pole theorem. Infinite products. This is the second course in a sequence of three: Mth470, 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 forcredit. . 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. Pontryagin 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 formathematics 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 approvalmay be repeated for credit.

Also offered for graduate-level credit as Mth 581.. Prerequisite: Stat 244 and two upper-divis ion courses approved formath 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 includedescriptive 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 for credit.
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 include inductive and deductive reas oning, 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 graduate-level credit as Mth 583.. Prerequisite: Mth 338.

## Mth 484 - Topics in Algebra for Mathematics Teachers (3)

Selected topics in algebra formathematics 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 departmental approval 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 analysis for mathematics teachers. Potential topics include functions, 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: Mth311.

## 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, finance mathematics, combinations, graph theory, algorithms, logic, and number theory. With departmentalapproval may be repeated forcredit.

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 for credit.

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. A vailable for graduate credit toward the graduate certificate programin middle school mathematics.
Also offered for graduate-level credit as Mth 591 and may be taken only once forcredit. . Prerequisite: Mth 112, Mth 212, Mth 213..

## Mth 493-Geometry for Middle School Teachers

 (4)Selected topics frominformal geometry, both twoand three-dimensional, with integration of problem solving and technology. Not approved for major credit. A vailable 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 forcredit. . 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 ofmore general algebraic structures and their applications, with focus on problemsolving. 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 for credit. . Prerequisite: Mth 112, Mth 212, Mth 213..

Mth 495-Historical Topics in Mathematics for Middle School Teachers (4)
A survey of the historical development oftopics in mathematics fromancient to modern times, with special emphasis on topics in arithmetic, algebra and informal geometry, and with integration of problem solving and technology. Not approved for major credit. A vailable 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 for credit. . 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 ofmathematics 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 problem solving and technology. Not approved for major credit. Available 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 forcredit. . Prerequisite: Mth 112, Mth 212, Mth 213..

## Mth 501 - Research (1-9)

(Credit to be arranged.) Consent of instructor.

## 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 instructor.

Mth 509-Practicum(1-9)
(Credit to be arranged.)

## Mth 510-SelectedTopics (1-6)

(Credit to be arranged.) Consent of instructor.

## Mth 511 -Introduction to Real Analysis I (3)

Analysis on metric spaces, Baire Category, ContractionMapping, and Stone-Weierstrass theorems. This is the first 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 411 and may be taken only once for credit. . Prerequisite:Mth 312. .

## Mth $\mathbf{5 1 2}$-Introduction to Real Analysis II (3)

Lebesgue measure 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-level credit as Mth 413 and may be taken only once for credit. . Prerequisite: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 forsystems. 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-level credit 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 localstability. 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 Lorenzsystem. 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: EitherMth 521 orboth Mth 254 and Mth 256.

## Mth $\mathbf{5 2 5}$-Elementary Differential Geometry II (3)

Surfaces of constant curvature, the Gauss-Bonnet theorem; spherical and hyperbolic geometry, elementary Riemannian geometry applications from mechanics and field theory. This is the second 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 425 and may be taken only once for credit. . Prerequisite: Mth 524. .
Mth 527-Partial Differential Equations I (3)
Solution techniques, qualitative analysis 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, butnotrequired.
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)
Higherdimensional equations, heat conduction in a disk, vibrating membrane, spherical problems, Bessel and Legendrefunctions, Green's functions, Fredholm alternative. Infinite domain problems, Fourier
transformsolutions, finite difference methods. This is the second course in a sequenceoftwo: 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 purposedefinition, and model validation. Models will be chosen from life, the physical and social sciences. Applications chosen from differential 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, nonEuclidean geometry, algebraic geometry, convexity, differential geometry, foundations of geometry, combinatorial topology. This is the first 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 431.. Prerequisite: Mth 311, Mth 338, or Mth 344..

## Mth 532 - Topics in Geometry II (3)

Topics selected fromprojective geometry, nonEuclidean 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-level credit as Mth 432. . Prerequisite: Mth 311, Mth 338, or Mth 344..

## Mth 533-Topics in Geometry III (3)

Topics selected fromprojective geometry, nonEuclidean geometry, algebraic geometry, convexity, differential geometry, foundations of geometry, combinatorial topology. This is thethird course in a sequence of three: Mth 531, Mth 532, and Mth 533; with departmental approval, this sequence may be repeated forcredit.
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 wellordered sets, Cardinal and ordinal numbers. The axiom of 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. . Prerequisite: 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 sequenceof three: Mth 534, Mth 535, and Mth 536 which must be taken in sequence.

Also offered for undergraduate-level credit as Mth 436 and may be taken only once for credit. . Prerequisite: Mth 535..

## Mth 541 - Introduction to Abstract Algebra I (3)

Group theory and homomorphismtheorems. 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. . Prerequisite: Mth $344 .$.

## Mth 542 - Introduction to Abstract Algebra II (3)

The theory ofrings, modules, and fields. This is the second 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 Galo is theory. This is the third course in a sequenceof 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. . Prerequisite: Mth 542. .

Mth 544 -Advanced Linear/Multilinear Algebra I (3)

Vectorspaces, 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 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 spectraltheory. This is the second course in 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. . Prerequisite: Mth $346 .$.

## Mth 551 -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 ofdifferential 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 integration and differentiation. Solution of linear equation systems. Eigenvalue problem, least square, Chebyshev, trigonometric and rational function approximation. Numerical solution ofdifferential equations. This is
the second 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 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 ofdifferential 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. . Prerequis ite: 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, Polya counting, block designs, orthogonal polynomials, and error-correcting codes. With departmental approval may be repeated for credit.
Also offered for undergraduate-level credit 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 sequence of 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 oftwo: 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 oftwo: 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, neces sary and sufficient conditions, overview of numerical algorithms, rate of convergence, line search and trust-region methods. Gradient descent, conjugate gradient, Newton and quasi-Newton methods, nonlinear least-squares problems, GaussNewton and Levenberg-Marquardt methods, practical applications. This is the first course in a sequenceof two: Mth 564 and Mth 565. Expected preparation: knowledge of a high-level programming language such as MATLAB, Python, R, or $\mathrm{C} / \mathrm{C}++$.
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 either Mth 256 or Mth 421/Mth 521..

## Mth 571 - Complex Analysis and Boundary Value Problems II (3)

Fundamental concepts of complexanalys is. Calculus of residues 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-level credit 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 differentialequations 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-level credit as Mth 472 and may be taken only once for credit. . Prerequisite: Mth 571..
Mth 577-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 577 and Mth 578 which must be taken in sequence. Expected preparation: Mth253, Mth 254.

Also offered for undergraduate-level credit as Mth 477 and may be taken only once for credit. . Prerequisite: Mth $256 .$.
Mth 578-Mathematical Control Theory II (3)
Elements of the calculus ofvariations 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 formathematics 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 approvalmay 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 in Statistics for Mathematics Teachers (2-3)

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 ), Central Limit Theorem, modeling and simulation techniques, and research design techniques. With departmentalapproval may be repeated for credit.

Also offered for undergraduate-level credit as Mth 482.. Prerequisite: Stat 244 and two upper-division courses approved formath 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, sphericaland/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 Algebra for 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 verbalrepresentation systems. With departmental approval 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 include functions, 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-level credit 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 formajor credit..

## Mth 587 - Topics in Discrete Mathematics for Mathematics Teachers (2-3)

Selected topics in discrete mathematics for teachers. Potential topics include set theory, logic, elementary probability theory, relations, recursions, algorithms, counting theory, permutations, finance mathematics, combinations, graph theory, algorithms, logic, and number theory. With departmentalapproval may be repeated for credit.

Also offered for undergraduate-level credit 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 powerful set 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 for credit.

Also offered for undergraduate-level credit 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 orhistory 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 statistics through laboratory experiments, simulations, and applications, 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 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 from informal geometry, both twoand three-dimensional, with integration of problem solving and technology. Not approved for major credit. A vailable 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 real number systemand its subsystems will lead to the introduction ofmore 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 oftopics in mathematics fromancient to modern times, 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 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 Class room (4)

A survey ofmathematics 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. Available for graduate credit toward the graduate certificate programin mathematics for middle school teachers.
Also offered for undergraduate-level credit 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 -Selected Topics (1-9)

(Credit to be arranged.)

## Mth 611 - Theory of Functions of a Real Variable I (3)

Lebesgue measure and outer measure, measurable functions and the Lebesgue integral, convergence theorems, productmeasures, andFubini'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)

Lebesgue 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)

Lebesgue measure and outer measure, measurable functions and theLebesgue 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 614-Modern Analysis I (3)

Topics fromnonlinear analysis, harmonic analysis, analytic functions, ordered vector spaces, analysis on Lie groups, andoperator theory. This is the first course in a sequence of three: Mth 614, Mth 615, and Mth 616. Expected preparation: Mth $412 / \mathrm{Mth} 512$.

## 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 thesecond
course in a sequence of three: Mth 614, Mth 615, and Mth 616. Expected preparation: Mth412/Mth 512.

## Mth 616-Modern Analysis III (3)

Topics fromnonlinear analysis, harmonic analysis, analytic functions, ordered vector spaces, analysis on Lie groups, andoperator theory. This is the third course in a sequence of three: Mth 614, Mth 615, and Mth 616. Expected preparation: Mth412/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 convexspaces, 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 convexspaces, 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 convexspaces, 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: M th $412 / \mathrm{Mth} 512$.

## Mth 621 - Advanced Differential Equations I (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 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 ofdynamial 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 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 ofdynamial 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 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 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 translations, holonomy, geodesics, curvature, is ometric 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 $425 / \mathrm{Mth} 525$.

## 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, is ometric embeddings and hypersurfaces, the Second Fundamental Form, 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: Mth425/Mth 525.

## Mth 634 -Algebraic Topology I (3)

Topics froms ingular and simplicial homology and cohomology theories, fundamental group and covering spaces, CW complexes and elements of homotopy theory, algebraic theory ofmanifolds, introduction to differential topology and vector bundles, applications. This is the first course in a sequence ofthree: 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 ofmanifolds, 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 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 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 ofthree: Mth 637Mth 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 sequenceofthree: 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 $443 /$ 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/Mth 543 or both Mth $442 /$ Mth 542 and Mth $445 / \mathrm{Mth} 545$.

## Mth 651 -Advanced Numerical Analysis I(3)

An advanced study of numerical methods with emphas is 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, integralequations, 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 453/Mth 553.

## Mth 652 -Advanced Numerical Analysis II (3)

An advanced study of numerical methods with emphas is 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, integralequations, 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 ofnumerical methods with emphas is 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, integralequations, 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 automorphism groups, 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 sequence of 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 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 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 -S tochastic Processes and Probability Theory I (3)
Sets, spaces, and meas ures. 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 -S tochas tic 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 $411 / \mathrm{Mth} 511$, Stat 463/Stat 563.

## Mth 669 -S tochas tic Processes and Probability Theory III (3)

Sets, spaces, and meas ures. 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 fromK16 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 801 -Research (1-12)

(Credit to be arranged.)

Mth 802 -Independent Study (1-12)
(Credit to be arranged.)

Mth 804-Cooperative Education/Internship (112)
(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 apply ing 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 prerequis ite for all MuEd 400 -level courses.

## MuEd 328 -Introduction to Music Education (2)

Overview of the music education profession, with emphas is 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 teacher education program. Special emphasis will be given to the teaching of these instruments to groups ofyoung 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 ofvocal techniques for students in the teacher education program. Specialemphasis 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 emphas is 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 ofhow to teach and play flute and double reeds (bassoon and oboe) fors students enrolled in the teacher education program.

## MuEd 337-Clarinet and Saxophone (1)

Study ofhow to teach and play clarinet and saxophone for students enrolled in the teacher education program.

## MuEd 338-High Brass Techniques (1)

Study ofhow 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)

For students in the Choral/General Music Education track. Techniques of brass and woodwind ins truments 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 instrumental jazz music. Includes rehears al techniques, basic arranging, swing concepts, rhythmsection 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 essentials 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 oftwo: MuEd 420 and MuEd 421.

Also offered for graduate-level credit as MuEd 520 and may be taken only once for credit. . Prerequis ite: MuEd 045, Mus 322, MuEd 328, MuEd 334. .

## MuEd 421-Choral Literature and Rehearsal Techniques II (3)

Students will learn the essentials of rehearsing large choral groups fromgrades 9-12 and requisite materials and techniques forstarting and building a high school choral program. This is the second course in a sequence of two: $\operatorname{MuEd} 420$ 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 adminis tration 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. . Prerequisite: 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 instrumental music in grades 9-12, primarily. Student will serve as a lab ens emble for each other and will play primary and secondary instruments. Score study, appropriate literature selection and administration 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 theKodály 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 graduate-level credit as MuEd 580 and may be taken only once for credit. . Prerequisite: juniorstanding..

## 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 with in the course.

Also offered for graduate-level credit as MuEd 581 and may be taken only once for credit. . Prerequis ite: MuEd 480 or MuEd 580 or other Kodály Level 1 coursework..

## MuEd 482 - Kodály Training: Level III (5)

The third course in the Kodály approach and its applications in the field of Mus ic Education. Students will participate in pedagogy, folk music, musicianship, materials, conducting, and choir classes 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 or other Kodály Level II coursework..

## MuEd 484-Music with Children (3)

Methods and materials forteaching general music classes in the elementary school. Designed for the mus ic specialist; required of all students who seek a basic teaching certificate in music. It is presupposed that all students haveperforming and theoretical skills and at least one year of music history. Concurrentenrollment in an appropriate practicum (Mus 409) required.
Also offered for graduate-level credit as MuEd 584 and may be taken only once for credit. . Prerequis ite: MuEd 045 and MuEd 328.
MuEd 508-Workshop(1-9)
(Credit to be arranged.)

## MuEd 520-Choral Literature and Rehearsal Techniques I (3)

Students will learn the es sentials of rehearsing large choralgroups 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 oftwo: 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 essentials of rehearsing large choral groups fromgrades 9-12 and requisite materials and techniques forstarting 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 mus ic 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 instrumental program are 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 orMuEd $522 .$.
MuEd 530-Managing the Music Classroom (2)
Focus on classroommanagementtechniques specific to music classrooms 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-level credit as MuEd 480 and may be taken only once for credit. . Prerequisite: 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. .

Prerequisite: MuEd 480 or MuEd 580 or other Kodály Level 1 cours ework..

## 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 classes within the course.

Also offered for undergraduate-level credit as MuEd 482 and may be taken only once for credit. . 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 classes within the course.
Prerequisite: MuEd 482/582 or other Kodaly Level III coursework..

## MuEd 584-Music with Children (3)

Methods and materials for teachinggeneral 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 haveperforming and theoretical skills and at least one year ofmusic history. Concurrentenrollment in an appropriate practicum (Mus 409) required.

Also offered for undergraduate-level credit as MuEd 484 and may be taken only once for credit. .
Prerequisite:upper-division standing in music..

## Mup - Applied Music

## Mup 190 - Applied Music (1-4)

Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits .

Prerequisite: approval of faculty applied mus ic 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.
Prerequis ite: approval of faculty applied mus ic supervis or.. Corequisite: Mus 195.

## Mup 190B - Applied Music: Bass (1-4)

Freshman year. Individual instruction in organ, piano, harps ichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.

Prerequis ite: 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 supervis or.. Corequisite: Mus 196.

Mup 190D-Applied Music: Percussion (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 supervis or.. Corequisite: Mus 195.

## Mup 190E- Applied Music: Early Instruments (14)

Freshman year. Individual instruction in organ, piano, harps ichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits .

Prerequis ite: approval of faculty applied mus ic supervis or.. Corequisite: Mus 197.
Mup 190F- Applied Music: French Horn (1-4)
Freshman year. Individual instruction in organ, piano, harps ichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.
Prerequisite: approval offaculty applied music supervis or.. 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 supervis or.. Corequisite: Mus 196.

## Mup 190H- Applied Music: Harpsichord/Organ (1-4)

Freshman year. Individual instruction in organ, piano, harps ichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.

## Mup 190I- Applied Music: Flute (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 supervis or.. Corequis ite: Mus 195.

## Mup 190J - Applied Music: Jazz Studies (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 mus ic supervis or.. Corequis ite: Mus 198.

## Mup 190K- Applied Music: Clarinet (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 mus ic supervis or.. Corequis ite: Mus 195.

## Mup 190L-Applied Music: Bassoon (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 supervis or.. Corequis ite: Mus 195.

## Mup 190M- Applied Music: Composition (1-4)

Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.

Prerequisite: approval of faculty applied mus ic supervis or.. Corequis ite: Mus 185.

## Mup 190N - Applied Music: Non-Western (1-2)

Freshman year. Individual instruction in organ, 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 organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.

Prerequisite: approval of faculty applied mus ic supervis or.. Corequis ite: Mus 195.

Mup 190P - Applied Music: Piano (1-4)
Freshman year. Individual instruction in organ, piano, harps ichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.

Prerequisite: approval offaculty applied music supervis or.. Corequisite: Mus 197.

## Mup 190Q-Applied Music: Harp (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 supervis or.. Corequisite: Mus 197.

## Mup 190S - Applied Music: Violin (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 supervis or.. Corequisite:Mus 196.

## Mup 190T-Applied Music: Trumpet (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 supervis or.. Corequisite: Mus 195.

Mup 190U- Applied Music: Trombone (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 supervis or.. 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 .

Prerequis ite: approval of faculty applied music supervis or.. Corequisite: Mus 197.

Mup 190W - Applied Music: Tuba (1-4)
Freshman year. Individual instruction in organ, piano, harps ichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits .

Prerequis ite: approval of faculty applied music supervis or.. Corequisite: Mus 195.

## Mup 190X-Applied Music: Euphonium (1-4)

Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits .

Prerequis ite: approval of faculty applied music supervis or.. Corequisite: Mus 195.

## Mup 190Y- Applied Music: Viola (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.. Corequis ite: Mus 196.

Mup 190Z-Applied Music: Saxophone (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 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 (14)

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: Bass oon (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.
Prerequis ite: MuP 190 and audition.. Corequisite: Mus 185.

Mup 290O-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 (14)

Junior year. Continuation of MuP 290. Maximum: 12 credits.

Prerequisite: MuP 290 and upper division 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: Bass oon (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.

Prerequis ite: 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.

Prerequis ite: 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.

Prerequis ite: MuP 290 and upper division 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: MuP 390 and audition.. Corequisite: Mus 395.

Mup 490B - Applied Music: Bass (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.

Prerequisite: MuP 390 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 (14)

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: MuP 390 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.
Prerequis ite: MuP 390 and audition.. Corequisite: Mus 398.

## Mup 490K- Applied Music: Clarinet (1-4)

Senior year. Continuation of MuP 390. Maximum: 12 credits.

Prerequis ite: MuP 390 and audition.. Corequisite: Mus 395.

Mup 490L-Applied Music: Bass oon (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.

Prerequis ite: MuP 390 and audition.

## Mup 4900-Applied Music: Oboe (1-4)

Senior year. Continuation of MuP 390. Maximum: 12 credits.

Prerequis ite: MuP 390 and audition.. Corequisite: Mus 395.

Mup 490P - Applied Music: Piano (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.

Prerequis ite: MuP 390 and audition.. Corequisite: Mus 397.

## Mup 490Q-Applied Music: Harp (1-4)

Senior year. Continuation of MuP 390. Maximum: 12 credits.

Prerequis ite: 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)
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 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 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 orches tral 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 491C - Applied Music in Secondary Area: Cello/Bass (1-2)

Private instruction in voice, keyboard, guitar, and orches tral 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 assigned MuP 591.

## Mup 491 F- 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 assigned 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 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 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 mus ic 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 (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 mus ic specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned 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 orches tral 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 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 assigned 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 assigned MuP 591.

## Mup 491P - Applied Music in Secondary Area: Piano (1-2)

Private instruction in voice, keyboard, guitar, and orches tral 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 491S - Applied Music in Secondary Area: Violin (1-2)

Private instruction in voice, keyboard, guitar, and orches tral 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 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 491 U- 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 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 491Y- 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 assigned MuP 591.

## Mup 491Z-Applied Music in Secondary Area: S axophone (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 mus ic specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned 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 organ, 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 organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.

Prerequisite: audition.
Mup 590E- Applied Music: Early Instruments (14)

Individual instruction in organ, 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 organ, 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 organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.

## Mup 590I- Applied Music: Flute (1-4)

Individual instruction in organ, 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 organ, 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: Bass oon (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 organ, piano, harpsichord, 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..

## Mup 591A - Applied Music in Secondary Area: Trombone (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 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 mus ic 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 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 591D-Applied Music in Secondary Area: Percussion (1-2)

Private instruction in voice, keyboard, guitar, and orchestralor 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 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 591G- Applied Music in Secondary Area: Guitar (1-2)

Private instruction in voice, keyboard, guitar, and orches tral 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 591H- 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 mus ic specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

## Mup 591I- Applied Music in Secondary Area: Flute (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 591J - 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 591 K- 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 assigned 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 assigned 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 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 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 assigned MuP 591.

## Mup 591S - Applied Music in Secondary Area: Violin(1-2)

Private instruction in voice, keyboard, guitar, and orchestralor 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 591T - 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 591U- 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 591V - 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 assigned MuP 591.

## Mup 591Y- 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 assigned 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 assigned MuP 591.

## Mus - Music

## Mus 047 -Final Project (0)

All Bachelor of Arts and Bachelor ofSciencedegree candidates must complete a final project consisting of one of the following: (1) a half recital, (2) a performance project, (3) regularperformances on area recitals.

## Mus 056 - Graduate Music His tory Entrance Exam (0)

The Graduate Entrance Examination in history is a diagnostic test designed to assess entering graduate students' knowledgeof music history as presented in traditional undergraduate his tory sequences. Students are expected to have a bas ic 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 fromall musical periods. Students who do not pass the examwill be required to take and pass Mus 529 Graduate History Review, before registering for any advanced graduate mus ic history courses. The examis given in June and September of each year. Contact the School 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' knowledgeof music theory as presented in traditional undergraduate theory sequences. Students are expected to have a bas ic knowledge of aural dictation, analysis and Seventeenth Century voice leading. The examination will include harmonic analys is from the Baroque through Romantic periods. Students who do not pass the exam will be required to take and pass Mus 512 Graduate Theory Review, before registering for any advanced graduate mus ic theory courses. The exam is 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, andrhythmic skills. Requires no previous musical experience. This is the first course in a sequence of 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 analys is, 12 -bar blues, non-chord tones, asymmetrical meter, and modes. Includes basic ear training, sight singing, 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 orpermission 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, sight 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 orpermission 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 offifth, key signatures, major and minorscales, triads and dominant seventh chord, and their implementation in blues formand popular song. No previous musical knowledge required. Complements Practical Musicianship.

## 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 appropriate Sight-Singing/Ear Training course is required. An entrance placement examination will be given. Basic KeyboardSkills is recommended for music 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 mus ic with written exercises and analysis based on the styles of Bach, Haydn, Mozart, Beethoven, and other 17th and 18th century composers. Registration in the appropriate Sight-Singing/Ear Training course is required. An entrance placementexamination 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 appropriate Sight-Singing/Ear Training course is required. An entrance placementexamination will be given. Basic Keyboard Skills is recommended for music majors and minors. This is the third course in a sequence of three: Mus 111, Mus 112, and Mus 113.

## Mus 114 -SightSinging/Ear Training I(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 I course is required. This is the first course in a sequence of three: Mus 114, Mus 115, Mus 116.

## Mus 115-SightSinging/Ear Training II (1)

Studies to develop the 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 sequenceof three:Mus 114, Mus 115, Mus 116.

## Mus 116-SightSinging/Ear Training III (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 third course in a sequence of three: Mus 114, Mus 115, Mus 116.

## Mus 125-Guitar Workshop(2)

A workshop for discussion and applications of guitar related topics. Topics to include technique, sightreading, transcribing. Audition may be required. This is the first course in a sequence of three: Mus 125, Mus 126, and Mus 127.

## Mus 126-Guitar Workshop (2)

A workshop for discussion and applications of guitar related topics. Topics to include technique, sightreading, transcribing. Audition may be required. This is the second course in a sequence of three: Mus 125 , Mus 126, and Mus 127.

## Mus 127-Guitar Workshop(2)

A workshop for discussion and applications of guitar related topics. Topics to include technique, sightreading, tran scribing. Audition may be required. This is the third course in a sequence of three: Mus 125, Mus 126, and Mus 127.

## Mus 128 -Recording Live Sound (4)

Provides students with the skills necessary to set-up and operate professional sound reinforcement equipment. Guides students through the ins and outs of sound systemcomponents, setups, mixing and troubleshooting, as well as principles and concepts fundamental to live sound reinforcement. Provides video tutorials with hands-on demonstrations providing tips and techniques used in reallive sound situations from indoor venues to outdoor stages.

## Mus 129 -Desktop Music Production (4)

Provides students with the necessary skills and techniques to produce CD quality music using modern music technology. Students will learn to record and edit audio froma 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, session managementare addressed. This is a repeatable, required course in the PSU Sonic Arts andMusic Production program.

## Mus 174 - Introduction to Music Technology (3)

A hands-on introduction to the basic concepts, equipment, andsoftware 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 ofyoga, Tai Chi, and general flexibility and relaxation exercises. There are no prerequis ites for this class. Equipment required: yoga mat and strap. Optional equipment: yogablock.

## Mus 188-Performance Attendance (0)

The student is expected to attend a minimum of eight live performances approved by the School of Music \& Theater foreach 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. A vailable only to students enrolled in large ensemble, chambermusic 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 ofstring, wind, keyboard, or vocal chambermusic. 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 classification, history, 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 ins truments/vocal parts as demonstrated in the literature. Develops aural recognition of each instrument.

## 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 ofmusical 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 the course deals with elements of music and small forms (201), and large forms of music and categories ofmusical literature (202). This is the second course in a sequence oftwo: 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 ofexperience as a singer or instrumentalist..

## Mus 205-Listening I(1)

Online listening survey of the major works within various musical traditions, 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 with in various musical traditions, 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 ofthree: 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. Registration 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-SightSinging/Ear Training IV (1)
Continuation of the study ofs ight-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 sequence of 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 course in 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 health-related 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-Sound 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 229-Recording Theory (4)

Up-to-date introduction to the art of audio recording with special emphasis on today's technology and the evolving marketplace, Comprehensive overview of microphones, specific techniques for recording drums, individual instruments and vocals. Considerations for Home studio development are discussed including DA W selection and acoustic conditioning.

Mus 231 -S urvey of Popular Music Since 1950 (4)
Informs students of musical, historical and social aspects of American popular mus ic 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 musical form and overall period style. Study of fugue, character piece, symphony, chamber forms, opera, and musical, and programand absolute music. Each week brings one significant piece.

## Mus 233 - Music Notation (4)

Provides students with thorough study in the principles of music notation, providing a comprehensive overview of specific techniques for
creating 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 ins truments 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 sequenceof 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 cours einvolves 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 fromtheoretical, 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 digitalaudio theory; microphone properties, applications, and ideal placements; and tools and techniques used to acquire robust and clear documentation of sound.

## Mus 246 -SAMP II: Studio Techniques (3)

Foundational study of the concepts and techniques used in commercialmusic production. This class will introducemulti-tack digital audio recording, editing,
mixing and signal processing. Topics will include MIDI music making with virtual ins trument 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 complex as signments, students will work through the mus ic production process from inception to distribution. The course includes an examination of the commercial mus ic 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 other types 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 other types of popular music in the twentieth century. This is the second course in a sequence oftwo: Mus 261 and Mus 262.

## Mus 271 -Jazz Improvis ation I (2)

Introduces the fundamentals of jazz improvisation. Beginning jazzskills include scales, song forms, melodic patterns, and repertoire development. Instructor approval required. This is the first course in a sequence of three: Mus 271, Mus 272, and Mus 273.

## Mus 272-Jazz Improvis ation II (2)

Introduces the fundamentals of jazz improvisation. Beginning jazzskills include scales, song forms, melodic patterns, and repertoire development. Instructor 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 improvisation. 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 abundance of 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 performsimple 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 performs 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 Piano III (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 performs 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 301 U-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 Modem Era. This is the first course in a sequenceoftwo:Mus 301U and Mus 302U.

## Mus 302U- Survey of Music Literature II: Romantic to Modern Era (4)

Fornon-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 Modem Era. This is the second course in a sequence of two: Mus 301U and Mus 302U.

Mus 304-Music History: Medieval, Renaiss ance, and Baroque (4)

Intensive analytical study of the history of music in the Medieval, Renaissance, and Baroque Periods (Mus 304), Class ical 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 ofthree: 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), Class ical 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, developed ternary 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 practical applications.
Prerequisite: Mus 213. Counterpoint (3) Intensive study of polyphonic music. Analysis and application in writing contrapuntal exercis es using two, three, and four voices. Prerequis ites: Mus 213.

## Mus 313-Counterpoint (3)

Intensive study of polyphonic music. Analysis and application in writing contrapuntal exercis es 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 baton technique 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 org anizations.
Prerequisite: Mus 320..

## Mus 322-Choral Conducting (2)

The principles of conducting and training choral organizations.
Prerequisite: Mus 320..
Mus 325-Guitar Workshop(2)
A workshop for discussion and applications of guitar related topics. Topics to include technique, sightreading, transcribing. Audition may be required.

## Mus 326-Guitar Workshop(2)

A workshop for discussion and applications of guitar related topics. Topics to include technique, sightreading, transcribing. Audition may be required.

## Mus 327-Guitar Workshop(2)

A workshop for discussion and applications of guitar related topics. Topics to include technique, sightreading, transcribing. Audition may be required.

## 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 computermediated instrument design, sound synthesis, programming, live interactive performance, and incorporation of visualmedia. Explorations culminate in public performance. May be repeated for up to a maximum of six credits .

Prerequisite: Mus 247 or permission 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 recordingstudios and performance spaces.

Prerequisite: Mus 247..

## Mus 346 -SAMP V: Music with Vis ual Media (3)

Examines music and sound design created 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.

Prerequis ite: 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 includingiOS, 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 businessworld.

Prerequis ite: Mus 346 or permis sion 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 His tory (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 fromabout 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 dissected 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 guitarby examining its history, repertoire and performers. The course will look at all aspects of the guitar's history fromthe related ancient Sumerian stringed instruments to the modern-day electric guitar.

## Mus 361 U- History of Rock Music I (1950-1970)

(4)

Traces the history and development of a popular music style in the United States, Great Britain, and other parts of the world from 1950 to 1970. Includes other types of popular music in the twentieth century. This is the first course in a sequence oftwo:Mus 361 and Mus 362.

## Mus 362U- History of Rock Music II (1970Present) (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 ofthe development of the Beatles' music from the late 1950's through the early 1970's. Students will gain a deeper understanding of the music throughelementary musical analysis of form, harmony, and recording studio techniques. The cultural context from which their music emerged and their significant influence on popular culture will be examined.

## Mus 364U- Modern Music Technology (4)

An in-depthexamination of digital technologies used for creating and distributing music, and the social impact of these technologies.

## Mus 365U- Film Music (4)

An aes thetic, historical, 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 popularmusic 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 broadercontext of American popular music history. 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 his torical 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/political movements in the United States, with special emphasis 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 A merican Studies.

Mus 374U- World Music: Africa and the Middle East (4)

Study of the major musical cultures of A frica and the Middle East. Explores social and cultural contexts, instrument types, and structural org anization 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, ins trument types, and structural organization of the music. Emphasis on listening. This is the second course in a sequenceoftwo, 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 areas of folk, popular, and classical mus ic genres.

## Mus 377U- World Music: Latin America and the

 Caribbean (4)The cours epresents Latin American musical genres and forms: bolero, bossa nova, choro, rumba, salsa, samba, tango, Latin pop. Against the backdrop of each country's his torical circumstances, music and social dancing are used as an entry point to understanding political events, culturaltrends, and a makeup of Latino cultural identities.

## Mus 381 -Music for Elementary Teachers (4)

Musical skills and concepts for the elementary classroomteacher. 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.

Prerequis ite: consent of instructor..

## Mus 394-Chamber Music (1)

Instruction in the art ofs mall 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 (112)
(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 407U-Seminar (4)

(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 410U-Selected Topics (4)

(Credit to be arranged.)

## Mus 411 -Topics in Music History (2)

Examines a selected theme in music his tory to be drawn from specific composers, performers, genres, styles, works, geographicallocations, ortime periods. Topics will be contextualized to address broader issues of race, ethnicity, gender, cultural significance, ownership, transmis sion, technology, and globalization. Specific topics vary by term. Course may be taken more than once with permis sion of instructor.

Prerequisite: Mus 306..

## 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 aspects of the music. Impres sionism, serialism, set theory, indeterminacy and minimalism 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 ofdis covering the sources of unity, variety, order, and expression present in them.
Prerequisite: Mus 311..

## Mus 424 -Instrumental Jazz Arranging I(2)

In-depth study and application of the fundamentals of composing and arranging for small 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 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 forcredit. . Prerequisite: Upper-divis ion standing..

## Mus $\mathbf{4 2 5}$-Instrumental Jazz Arranging II (2)

In-depth study and application of the fundamentals of composing and arranging for small to large jazz ensembles. Subjects included are history, transposition, instruments, forms, harmonic and melodic construction, rhythm section, 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 forcredit. . Cross-Listed as: Upper-division standing..

## Mus 426-Instrumental Jazz Arranging III (2)

In-depth study and application of the fundamentals of composing and arranging for small 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, rehearsaltechniques, 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 forcredit. . Prerequisite: Upper-division 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 forcredit. . Prerequisite: consent of instructor through audition..

## Mus 428-Opera Production (2)

Annual production of a major operatic work. Designed forsingers, orchestral instrumentalists, and technical supports staff in the areas of costuming, set design, and other areas. Casting for production is by audition during winter quarter.
Also offered for graduate-level credit as 528 and may be taken only once for credit..

## Mus $\mathbf{4 3 0}$ - 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. Emphas is on analysis of scores and recordings.

Also offered for graduate-level credit as Mus 531 and may be taken only once forcredit. .Prerequisite:Mus 304, Mus 305, Mus 306.

## Mus 432 - Band Wind Literature (3)

A study of literature forensembles of wind and wind/percussion instruments fromabout 1600 to the present. Historical perspective will be gained through reading, style-analysis, and lis tening. 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 forcredit. . Prerequisite: Mus 304, Mus 305, Mus 306..

## Mus 433-Orchestral Literature (3)

A historical survey of the music associated with the symphony orchestra fromthe development of each orchestral instrument to the presentday. 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 (3)

This course offers an investigation and analysis of literature for choir of all sizes, forsecular and sacred use, particularly in relation to use in public school at the junior high and high school levels and in church choirsituations. A survey of the development of choral literature fromc. 1400 to the present, with examples via listening and study ofscores, will be included.
Also offered for graduate-level credit as Mus 534 and may be taken only once forcredit. .Prerequisite: Mus 304, Mus 305, Mus 306.

## Mus 436-Opera Literature (3)

An intensive study of the developmentofopera in western music, fromthe works of Monteverdi in the early 17th century to the important operas of this century.
Also offered for graduate-level credit as Mus 536 and may be taken only once forcredit. . Prerequisite: Mus 304, Mus 305, Mus 306.

## Mus 437-Keyboard Literature (3)

A study of Baroque, Classical, Romantic, and Twentieth Century literature forkeyboard instruments. In addition to providing an overview of the his torical development of keyboard music, specific works from the repertoire of each period will be selected for intensive study and performance. Intended primarily forpiano orharpsichord majors. This is the first course in a sequence oftwo: Mus 437 and Mus 438.

Also offered for graduate-level credit as Mus 537 and may be taken only once forcredit. .Prerequisite: by audition..

## Mus 438-Keyboard Literature (3)

A study of Baroque, Classical, Romantic, and Twentieth Century literature forkeyboard instruments. In addition to providing an overview of the historical development of keyboard music, specific works from the repertoire of each period will be selected for intensive study and performance. Intended primarily for piano orharpsichord majors. This is the second course in a sequenceof two:Mus 437 and Mus 438.
Also offered for graduate-level credit as Mus 538 and may be taken only once forcredit. .Prerequisite: by audition..

## 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, saxophone, 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 forcredit. . Prerequisite: Mus 304, Mus 305, Mus 306..

## Mus 445-Business of Music (3)

Comprehensive examination of performance and production as professions for musicians of all genres. Areas of focus include employment strategies, profes sional affiliations, music career expectations, entertainment industry and management. Topics include branding, 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 450 - 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 graduate-level credit as Mus 550 and may be taken only once for credit.. 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 standard duo 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 providepianists with skills needed to function successfully in many different professional environments. Many of these skills were previously common among pianists such as transposition, harmonization, and figured bass reading but fell out of favor over time. Other advanced skills were born out oftoday's professional requirements such as playing froma chord chart, using electronic instruments, and extended keyboard techniques.
Also offered for graduate-level credit as Mus 552 and may be taken only once forcredit..

## Mus 471 - Advanced Jazz Improvis ation I (2)

Advanced concepts of jazzimprovisation. Principles of pentatonics, diminished harmonies, ins ide-outside playing, synthetic scales, and free improvisation.

Instructor approvalrequired. 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 forcredit. . Prerequisite: Mus 271, Mus 272, and Mus 273 ..

## Mus 472 - Advanced Jazz Improvisation II (2)

Advanced concepts of jazzimprovisation. 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 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 jazzimprovisation. Principles of pentatonics, diminished harmonies, ins ide-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 forcredit. . 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 forcredit. . 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 sound editing 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 classroom with focus on individual and group instruction. This is the first course in a sequenceof 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 teachinggeneral 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 haveperforming and theoretical skills and at least one year ofmusic history. Concurrentenrollment in an appropriate practicum (Mus 409) required.

Also offered for graduate-level credit as Mus 584 and may be taken only once forcredit.. Prerequis ite: upper divisionstanding 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 sequenceof three: Mus 485, Mus 486, and Mus 487.

Also offered for graduate-level credit as Mus 585 and may be taken only once forcredit. . Prerequisite: Upper-division standing..

## Mus 486 -Diction for Singers: German (2)

Designed fors ingers 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 forcredit. . Prerequisite: Upper-division standing..

## Mus 487-Diction for Singers: French (2)

Designed forsingers 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 expres sively. 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 forcredit. . Prerequisite: Upper-division 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 clas s will involve some lecture, but will primarily focus on storytelling, character development, and otherperformance 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) <br> (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 orperformance recital required for all Master ofMusic degrees.

## Mus 507 -Seminar (1-6)

(Credit to be arranged.) Consent of ins tructor. 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 history, literature, and music education. Emphasis 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 their knowledge of basic theoretical concepts. Can be taken for credit 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 auralskills. Sight singing, melodic and harmonic dictation, aural identification, and improvisation are integral elements of this study. Note: graduatereview class credits cannot be applied towards completion of degree requirements.

## Mus 515-Graduate Aural Skills ReviewII (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: graduatereview clas scredits cannot be applied towards completion of degree requirements.

Prerequisite: Mus 514.
Mus 516-Graduate Aural Skills ReviewIII (1)
Designed forgraduate 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: graduatereview class credits cannot be applied towards completion of degree requirements.

Prerequisite: Mus 515.

## Mus 520 - Analytical Techniques (3)

Study of analytical techniques 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 orches tras, showing basic techniques of scoring for string quartet, woodwind and brass quintet, and percussion ensemble. Practical application through scoring of piano music forvarious orchestral groups of the nature and capability found in the public schools.

Prerequisite: 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 small 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. Ins tructor approval required. This is the first course in a sequence of 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 small 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 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 small 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 524, Mus 525, and Mus 526.
Also offered for undergraduate-level credit 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 ins tructor through audition..

## Mus 528-Opera Production (2)

Annual production of a major operatic work. Designed forsingers, 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.
Also offered for undergraduate-level credit as 428 and may be taken only once for credit..

## Mus 529-Grad History Review (3)

A course designed for graduate students who need to review their knowledge ofbasic historical concepts of music. Can be taken for credit 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 pers pectives 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)

His torical 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. . Prerequisite:Mus 304, Mus 305, Mus 306 ..

## Mus 532 - Band Wind Literature (3)

A study of literature forensembles of wind and wind/percussion ins truments 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 undergraduate-level credit as Mus 432 and may be taken only once for credit. . Prerequisite: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 orchestral instrument to thepresentday. 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. . Prerequisite: Mus 304, Mus 305, Mus 306 ..

## Mus 534-Choral Literature (3)

This course offers an investigation and analysis of literature for choir of all sizes, forsecular and sacred use, particularly in relation to use in public school at the junior high and high school levels and in church choirsituations. A survey of the development of choral literature fromc. 1400 to the present, with examples via listening and study ofscores, will be included.
Also offered for undergraduate-level credit as Mus 434 and may be taken only once for credit. . Prerequisite: Mus 304, Mus 305, Mus 306..
Mus 536-Opera Literature (3)
An intensive study of the developmentof opera in western music, fromthe works of Monteverdi in the early 17 th 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 (3)

A study of Baroque, Classical, Romantic, and Twentieth Century literature for keyboard instruments. In addition to providing an overview of the his torical development of keyboard music, specific works fromthe repertoire of each period will be selected for intensive study and performance. Intended primarily forpiano orharpsichord 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. . Prerequisite: by audition..

## Mus 538 - Keyboard Literature (3)

A study of Baroque, Classical, Romantic, and Twentieth Century literature for keyboard instruments. In addition to providing an overview of the his torical development of keyboard music, specific works from the repertoire of each period will be selected for intensive study and performance. Intended primarily forpiano or harps ichord majors. This is the second course in a sequence of two: Mus 537 and Mus 538.

Also offered for undergraduate-level credit as Mus 438 and may be taken only once for credit. .
Prerequisite: by audition..

## 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, saxophone, 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 undergraduate-level credit 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 Jazzcompositions and recordings.

Prerequisite: Mus 355U..

## Mus 541 - Advanced Conducting Methods (3)

Study of the concep ts of conducting applied to a wide range of music literature. Music ofdifferent eras will be used to analyze and practice the conductor's process. Incorporated into the study of conducting will be rehearsal techniques and relevant historical and theoretical concepts, providing an integrated study of the conductor's art. This course is intended for MA/MS in Mus ic graduate students, MM in Conducting graduate students, or senior-level undergraduate students with ins tructor permis sion.

Prerequisite: graduatestanding in music or permission 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 rehears al techniques and relevant historical and theoretical concepts, providing an integrated study of the conductor's art. Particular attention given to the creative role of the University, Church, Community, and Public School Choir Director. This course is intended for MM in Conducting graduate students.
Prerequisite: graduatestanding 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 relevant historical 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.

Prerequis ite: graduatestanding in music..

## Mus 545 -Business of Music (3)

Comprehensive examination of performanceand production as professions for musicians of all genres. Areas offocus include employment strategies, professional affiliations, music career expectations, entertainment industry and management. Topics include branding, marketing, accounting, taxes, distribution and labels, rights and royalties, business relationships, and professional org anizations.

Also offered for undergraduate-level credit as Mus 445 and may be taken only once for credit.. Prerequisite: upper-division standing..

## Mus 550-Collaborative Piano Literature Strings

 (3)Introduction to the instruments fromthe string family through in-depth study of the ins truments themselves and standard duo repertoire.

Also offered for undergraduate-level credit as Mus 450 and may be taken only once for credit..

## Mus 551 - 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 standard duo repertoire.
Also offered for undergraduate-level credit as Mus 451 and may be taken only once for credit..

Mus 552 - Advanced Keyboard Techniques (3)
This course is designed to providepianists with skills needed to function successfully in many different professional environments. Many of these skills were previously common among pianists such as transposition, harmonization, and figured bass reading but fell out of favor over time. Other advanced skills were born out oftoday's professional requirements such as playing froma chord chart, using electronic instruments, and extended keyboard techniques.
Also offered for undergraduate-level credit 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 historical events. This course may be repeated for credit.

Prerequisite: Pass Mus 056 or Mus 529..

## Mus 561 - Music History: The Renaiss ance Period

 (2)Intensive, analytical study of the his tory of music from 1400 to 1600 and its relationship to contemporary historical events. This coursemay be repeated for credit.

Prerequisite: Pass 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 historical events. This coursemay be repeated for credit.

Prerequisite: Pass Mus 056 or Mus 529..
Mus 563-Music History: The Classical Period(2)
Intensive, analytical study of the his tory of music from 1750 to 1825 and its relationship to contemporary historical events.

Prerequis ite: Pass Mus 056 or Mus 529..
Mus 564 -Music History: The Romantic Period (2)

Intens ive, analytical study of the his tory of music from 1825 to 1900 and its relationship to
contemporary historical events. This coursemay be repeated for credit.
Prerequisite: Pass Mus 056 or Mus 529..
Mus 565 -Music History: Early 20th Century (2)
Intensive, analytical study of the his tory of music from 1900 to 1950 and its relationship to contemporary historical events. This coursemay be repeated for credit.
Prerequisite: Pass Mus 056 or Mus 529..
Mus 566 -Music History: Music Since 1950 (2)
Intensive, analytical study of the his tory of mus ic since 1950 and its relationship to contemporary historical events. This course may be repeated for credit.

Prerequis ite: Pass Mus 056 or Mus 529..
Mus 567 -Jazz His tory (2)
Advanced studies in JazzHistory. 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 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 jazzimprovisation. 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 jazzimprovisation. 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 mus ic 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 performer sing 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 classroom with 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.
Prerequisite: Mus 213, Mus 216, Mus 304, Mus 305, Mus 306.

## Mus 584 -Music with Children (3)

Methods and materials for teachinggeneral music classes in the elementary school. Designed for the mus ic specialist; required of all students who seek a basic teaching certificate in music. It is presupposed that all students haveperforming and theoretical skills and at least one year ofmusic history. Concurrentenrollment 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 fors ingers 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 fors ingers 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 expres sively. 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 fors ingers 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 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 als o provides a forum for problemsolving and dealing with special is sues 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: graduatestanding 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 principalsubject 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 endangered native languages of North America. Topics includestructure of native languages; relationship of language to other aspects of culture such as worldview, social organization, 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 as sortment of gras sroots organizations that fought for treaty rights, tribal sovereignty, self-determination, cultural
preservation, and cultural relevancy in education. This course will examine the Alcatrazoccupation and the governmentresponse.

## NAS 334U- Topics in Film Genres and Movements (4)

Study ofmajor 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 ofedible/medicinal gardens and participate in restoration and creative place-based projects on public lands.

## NAS 344 - Indigenous Women Leadership (4)

From Sacajawea to W inona 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 Iss ues in Indian Country (4)

This course examines issues and challenges in Indian Country today, including economic development, natural resource management, 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 is sues and how tribes and urban Native communities and organizations are planning, advocating, and
taking action locally, nationally, and globally. This course may be repeated for up to 8 credits.

## NAS 346 - Contemporary Iss ues in Indian Country (4)

This course examines issues and challenges in Indian Country today, including economic development, natural resource management, health, education, identity and as similation, 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 organizations 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/informenvironmental 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 351 - Indigenous Philosophy (4)

Surveys his torical and contemporary indigenous philosophical writings on decolonization, epistemology, metaphysics, and ethics. The majority of the texts will be from authors such as Black Elk, 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 identify ing 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 399 - Special Studies (1-6)
(Credit to be arranged.)

NAS 401 - Research (1-8)
(Credit to be arranged.)

## NAS 404-Cooperative Education/Internship (112)

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 from both inside and outside the state-centric global capital system. This course looks to distinguish between Indigenous place-based 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 includehistory of attempts to eradicate native languages and theeffects on those languages and their communities; theoretical basis for revitalization; emerging tribal policies; and relations between linguists and native communities.

## NAS 426-Tribal Critical Race Theory (4)

This course involves the dis courseon Native American Studies from the perception of Indigenous storytellers, artists, and activis ts whose compelling productions undertake critical examinations of imperialism, history, writing and theory-- focusing on strategies of resistance. These productions will help us challenge myths about Indigenous peoples which replicate and reproducestereotypes.
Prerequisite: NAS 201 or instructor approval..
NAS 442 - Decolonizing Methodologies : Ins urgent Res earch and Indigenous Education (4)

Decolonizing Methodologies will provide students the analyticaltools and methods necessary for conducting applied research, as well as exploration of the practical, ethical, and political issues 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 507 -Seminar (1-8)
(Credit to be arranged.)

NAS 509 - Practicum (1-9)
(Credit to be arranged.)

## NAS 510 -SelectedStudies (1-8)

(Credit to be arranged.)

## 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 sequenceof 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 ofbasics introduced in first-year courses and further development of communication skills. This is the first course in a sequenceof 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 sequence of 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 506-Special Projects (1-6)

(Credit to be arranged.)

## OMSE 507 -Seminar (1-8)

(Credit to be arranged.)

## OMSE 510 -Special Topics (1-4)

(Credit to be arranged.)

## OMSE 511 -Managing Software Development (3)

Provides the knowledge and skills needed to plan, organize, lead, and control a software project. Topics include planning and estimating, measuring and controlling, and leading and directing a software project. Quantitative measures and risk management will be emphasized throughout the course. Students will prepare project plans for real or hypothetical software 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 decisionmaking skills, and profes sional ethics. Students will engage in a project that covers the major topics of the course. Two years of software development experience is required for registration.

## OMSE 514 -Computing Foundations (3)

Introduction to the building blocks of a bas ic 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 organizations including pipelining, virtual memory and caching are explored. Also explores the principles ofoperating systems and how they relate to the underlying hardware structures as well as concurrency, process synchronization, process scheduling, memory management, interrupt handling, and device management. Bas ic understanding of $\mathrm{Cor} \mathrm{C}++$ required.

## OMSE 515-Software Foundations (3)

Introduction to fundamental language constructs including pointers, recursion and abstraction, and the principles of algorithmic analysis andBig-O notation. Progres sively explores several foundation data structures and algorithms including linked lists, trees, hashing, and graphs which are illustrated using C, $\mathrm{C}++$ and Java code fragments. Introduces selected topics in statistics and discrete mathematics, in particular, sets, setoperations, propositional calculus, first-order predicate calculus and finite state machines. Registration requires permission of the OMSE programoffice. Recommended prerequisite: Mth 112.

## OMSE 516 -S oftware Process Improvement (3)

How to effectively introduce improvements to software engineering processes in their organization. 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 butbalanced with real-world considerations including organizational politics, corporateculture, 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. Als o 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)Abstractmodels 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 ofsoftware systems. Provides the fundamental mathematical concepts needed to understand abstract models ofsoftware 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 assessing 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 testability; maintaining quality while supporting existing software. Two years ofs oftware 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 specify ing 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 versions. Survey of the major architectural styles, their strengths and weaknesses, and architectural trade-offs with respect to system goals and desired properties. Study of architectural approach to developmentof open systems and frameworks based on case studies. Software engineering ofdomain-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 business context 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 hands-on 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 theeffect of design decisions on function, quality, cost, and schedule. Foundation coursework is required for registration.

## OMSE 534 -S oftware Estimating (3)

Software estimating techniques and tools enable the responsible software engineering manager to as sess project feasibility, secure adequate budgets, and manage project tasks and schedules. The student learns how to make viable softwareestimates to cons istently informs oftware project planning, scheduling, and oversight. The full range of software estimating methods and tools are explored.

Prerequis ite: OMSE 500, 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, tes tability, and maintainability. Verification topics include structural (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, testexecution, 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 result from systematic improvement of the software development process and systematic reuse of 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 thereuse of non-code products, including requirements and design.

Prerequisite: All previous OMSE courses.

## OMSE 555-S oftware Engineering PracticumI(3)

The objective of the practicum is 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 OMSE 556 ( 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 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 first course in a sequence oftwo: OMSE 555 and OMSE 556 which must be taken in sequence.

Prerequis ite: All core OMSE courses 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 -S oftware Engineering Practicum II (3)

The objective of the practicum is 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 OMSE 556 ( 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 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

## OSEA 410 - SelectedStudies -Study Abroad (118)

(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 thoughtandaction. The course will examine the values, skills and actions that contribute to a sense of civic identity through assigned 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 communitybased learning project.

## PA 312U- Foundations of Community Leaders hip

 (4)This course explores the role of community leadership in advancing civic engagement, civil society, civic capacity, community-building, reasoned debate and other key civic virtues in democratic societies. Students will integrate leadership theory with practical observations in the context of the United States' socio-political his tory and the role of civic engagement in our evolving social system. The course builds a definition for community leadership that recognizes theclose 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 313 U- Fundamentals of Public Service (4)

Exploration of how public service informs the roles of public/nonprofit organizations in social change. Introduction to conceptual public service frameworks and exploration of the his torical dimensions, underlying values and external forces that shape contemporary public service. Ways for community 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 dis cussions about public sector (government and nonprofit) organizations as well as private sector organizations. Topics includehuman capital, workplace politics, intergenerational challenges, and job/wage dis parities.

Prerequisite:juniorstanding..

## PA 316 -Leadership in New Student Programs (3)

Focus on developing an understanding of the transitional needs ofstudents 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 Change Model 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 and examination 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 non profit 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 - SelectedTopics (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 goal is 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.

Prerequis ite: 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 unders tanding 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 social decision-making 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 investigates 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 ins titutions and private interests by analyzing the mechanisms that generate participation 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 demons trates their learning about civic leadership.
Prerequisite: One of PA 311U, PA 312U or PA 313 U , 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 themto judge theethical 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 forvolunteers; 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, measureable learning objectives, selecting the bestteaching 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 -Leaders hip 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 accomplis hments 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 integrative experience 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 regardless of experience. Thestudent completes a field experience with an appropriate agency, culminating in a project report systematically analyzing an adminis trative problemthat is both instructive 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 programofstudy.

## PA 510 - Selected Topics (0-6)

(Credit to be arranged.)

## PA 511 - Public Administration (3)

The role of adminis tration 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 American governmental and nonprofit traditions.

## PA 512-Case Analys is (3-6)

This course is designed to providemid-career students with adminis trative experiencean opportunity to develop skills in the areas of reflective practice, administrative problemsolving, consulting, and coaching. Students will be required to present a case problem they developed as the basis of an exercise in adminis trative problemsolving and coaching for their fellows tudents.
Prerequisite:at leastthree years offull-time administrative or management experience in a public, nonprofit and/or healthcare organization and 42 hours of completed coursework to ward 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 andadministrative discretion.
Prerequisite:PA 511..

## PA 514 - Global Leadership and Management (3)

Contemporary global realities require emerging public sector leaders to prepare themselves by learning adaptable leadership and management concepts andtools. 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 responsibly" in a range of global settings.

## PA 515 - Public Works Administration (3)

A general overview of adminis trative practices in public works, including anevaluation of organizational practices, project management, and relationships to political processes. The course will consider actual problems in the adminis tration of public works.

## PA 516-Current Is sues 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 use of deliberative processes, reliance on collaboration, and a greater role of nonprofit organizations in the design and delivery of public services. The purpose ofthis course is to examine theseapproaches within the context of traditional models that have guided the
public policy and management role of the bureaucracy in the American systemofdemocratic governance.

## PA 517 - Leadership Development for Public Organizations (3)

Course focuses on two activities: (1) use of assessment 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 assistparticipants 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 supportfor the vision, and transforming thevision into an organizational legacy. It focuses on the distinctive role responsibilities of the leaderas an agent of the organization within the larger community setting, thus distinguishing the course fromother leadership classes that focus on either an individual or organizational 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 collaborativeagreements.

## 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 developmentof 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 issues of not-for-profit organizations. It considers such items as the following: the executive director as manager, aspects of governance; volunteer/staffrelations; personnel admin is tration; 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 fromgovernment 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 ofthe roles ofboards in governance and leadership; policy and administration; decis ion-making processes; board-staffrelations; 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 civilsociety, as well as the roles of NGOs in fighting oppression, safeguarding theenvironment, building and training workforces and advocating major societalchanges.

## PA 524 -Financial Management in Nonprofit Organizations (3)

Designed to provideparticipants without formal accounting or finance training with the conceptual framework and practicaltools needed to provide strong fis cal 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 fis cal management objectives and functions in nonprofit with those found in forprofit and/or governmental entities. 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 program or 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 forsuccessful 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 emerg ing organizations. Examines a wide range of management and leadership needs, problems and is sues that arise for an organization in its early years. Explores how an organization develops and emerges and how the traditional tasks of management: supervision, planning, budgeting, fundrais ing 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 organizations, juris dictions, and sectors to address entrenched social problems. This course operates from the assumption that a collaborative, systems-based approach to leadership is essential 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 organizational, community, and sector-wide 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 immersion homestays, and visits to cultural sites. The programvaries fromyearto 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 neces sary, but Spanish language study is part of the immersion experience.

## PA 530 - Higher Education Policy (3)

Seminar explores critical issues 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 between higher 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 associated 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 courseexamines the process of policy implementation through the use of administrative discretion and the rule-making process. Delegation of legis lative power, judicial review, informal adjudication, and the role of the administrative 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 disaster planning. Introduces practical tools for analyzing community vulnerabilities and actions to take to improve resilience.

Cross-Listedas: 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 use of casestudies 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 issues in judicial policymaking, examines fields where courts haveplayed 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-firstcentury. Investigates the many meanings of the term" civil society," as well as the role of nonprofit and voluntary organizations in lobbying and advocacy, and therole ofcitizen 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 administration, the National Policy Process is studied on-site in Washington, D.C. Attention is paid to the actors and the action of policy process, to the institutionalization of that process, and to the administrative components of that process. Meetings are arranged with key policy actors in appropriate org anizations 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 legis lation or setoflegis 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 organizational design, power and authority, leadership, teamwork, communications, work design, and motivation. Emphas is 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 Entrepreneurs hip (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 successful cases of socialentrepreneurship and develops competencies to create organizations that generate revenues while serving a social mission. Students learn about setting up and managing social entrepreneurial 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 fromaround the U.S. and around the world, we examine sustainable 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 issues through alliances with other organizations in the nonprofit, for-profit, and government organizations. This course introduces students to the theory and practiceof collaboration through in-class and "living" case studies 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 us ing 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 forsuccess" in developing and implementing public policy initiatives. Students use this international comparative governance experience to reflect on the consequences for improving public service innovation and practices within their home organizations and juris dictions 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 team settings.

## PA 545-Organizational Development (3)

A consideration of organization developmentas a strategy for organizational 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 therole ofthe supervisor in contemporary public and nonprofit organizations and the knowledge, skills, and abilities needed to effectively perform this 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 responsibilities 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 service roles.

## PA 549-Cross-cultural Communication in the Public Sector (3)

An examination of intercultural communication as pects, processes, and scenarios occurring in public sector interactions. Emphasis on external client/ constituent relationships. Development of intercultural awareness is a key goal introduced through class discussion, scenario investigation, and res earch projects. The course is highly interactive with class discussion required.

## PA 550 - Managing Information Res ources (3)

Considers information management and computer information systems as they affect public management and public policy. Basic concepts are covered, andemphasis is placed on the use of computerized information technologies as management tools for public sector administrators. Substantialuse is made of case studies to highlight how the public sector manager may most appropriately and effectively use computer resources and avoid inappropriate and misleading 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 analysis and presentation, statistical reasoning, and computer applications for statistical analysis.

## PA 552 - Analytic Methods in Public Administration II (3)

A continuation and expansion 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 research design and data collection; statistical
modeling, forecasting, programevaluation, and other areas of applied research.

Prerequisite: PA 551.
PA 552R-(0)

## PA 553 - Sus tainable 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 studentto become proficient in the use of reference tools for successfully undertaking policy research. Students are required to identify a policy issue and to use library and online resources to track a piece of public policy through the stages of agenda-setting, legislative policy-making, administrative implementation, court adjudication, and follow-up analysis and evaluation of cons equences. The course consists of a series ofonline exercises corresponding to each stage of the policy development and implementation process. The exercises are supplemented with discussion and lectures.

## PA 555 - Program Evaluation and Management

 (3)Examines programevaluation from the perspective of the public adminis trator. Covers the major approaches, methods, and concepts in the field of programevaluation. Topics include impact as essment, research design, qualitative evaluation methods, performance auditing, benefit- cost analys is, and other selected topics.

## PA 556 - Public Contract Management (3)

Explores what happens when public sector organizations formworking 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 fromthe perspective of the generalist manager rather than froma narrow technicalview. 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 ortechnical background is not required. A variety oftopics will be covered, with some flexibility in choice of topics according to students' interest. Topics include: linear programming, queueing, simulation, decision analysis, forecasting, PERT/CPM, inventory analysis, and replacement analys is. 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 nongovernmental organizations) programs and projects. Draws on contemporary literature and case studies. Students apply their management learnings fromthis course to a real-life programor project.

## PA 559 - Res earch Design and Analytic Methods for Administrative Leaders (3)

This course provides administrative leaders with the essential 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 administration 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 adminis tration learn that leadership within the organization, engagement with the community, and work across organizational 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 administration and policy throughout the nation. At the core of these relationships is a set of concerns about the political, legal, fiscal, and organizational relationships across governments and sectors. This course provides an indepth 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 holding individual employees and public 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 administrators 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 governanceof the environment 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 issues, how policy tools can be
effectively matched to specific environmental problems, and how social sciences and ecology can be integrated foreffective environmental problemsolving.

## PA 565-Natural Res ource 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 environmentalquality. Specialattention is paid to policy and adminis trative governance is sues like sustaining common pool goods, structuring interg overnmental relations, and evaluating policy implementation strategies of direct production, planning, regulation, and changing market incentives. A centralpremise is that natural resource administrators face a policy arena that is intrinsically problematic because of the dynamic nature of social values about natural res ources, the long time horizon implicit in res ource 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 res ource administration specialization.

## PA 566 - Water Res ources Policy and Administration (3)

Reviews the history, politics, and institutions related to current water policy and administration in the United States. Examines policy history leading to presentinstitutional and legal arrangements for federal, tribal, regional, state, and local water quality and quantity decision making. Attention is givento the industrial development of the East and created water res ources 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 "watershed" 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 social issues.

## 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 ofhydroelectric 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 issues 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 resource policy and management. Focuses on how policy affecting public and private forest land is made and implemented. Case studies, largely from the northwestern United States, are used to examine these processes. History, laws, and programs relating to forest land ownership, public and private forest management, and associated environmental protection are studied at the federal and state levels. Specialattention is given to understandinghow 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 Wildlife 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 from the northwestern United States, are used to examine these processes. Policy history is studied at the state and federallevel with particularattention to the federalization of authority in this arena and the role of interest groups in policymaking and implementation. Current issues like endangered species, the role of tribes, bio-diversity conservation, and inter-jurisdictional management of fish and wild life are the focus of study.

## PA 570 - Environmental and Natural Resource Leadership (3)

Skills, styles and attributes of those who lead natural res ource and environmental organizations 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, regardless 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 Bas in governance as a case study to build an understanding ofhow organizational 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 dis cussion. Expected preparation: PA 540 Administrative 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 theconditions that need to be in place for its success as a policy tool for reducing CO 2 emis sions. Students will be provided with the historical development of the technology and its current status from the standpoint of policy implementation. Expected preparation:PA 540 Administrative Theory and Behavior.

## PA 574 - Food and Agriculture Policy (3)

Course explores food- and agriculture policy development and implementation at global, national, and locallevels. Examines the social, economic and environmental as pects of food and agricultural systems, including impacts of trade and aid policies, the Farm Bill, food system frameworks, and crosscutting is sues 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 the new 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 satisfy ing agreements, including how to frame an is sue to increase the group's chance forsuccess.

## PA 577 - Case Studies in Collaborative Governance (3)

Student teams to review 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 typologies for different forms of collaborative governance and provides theory-based frameworks to assist in analyzing governance networkefficacy.

## 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 mechanis ms and instruments are assembled into a policy mix can be helpful or seriously problematic.

## PA 581 - Advanced Fundraising (3)

Focus on the understandings, processes, and skills that are necessary forsuccessfulmajor 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 leaders hip especially volunteer leadership and the relationship of that leadership with other human resources such as the Development Officer and the Chief Executive Officer. Expected preparation: PA 526.

## PA 582 - Public Budgeting (3)

Focuses on the major dimens ions of public sector budgetary systems. Major emphasis will be devoted to the local budget processes. Topics will include basic concepts ofpublic budgeting, thebudgetcycle, budgetstrategy, planning and presentation, alternative budgeting systems, the budgetas a political and managementtool.

## PA 583-Advanced Budgeting Concepts and Techniques (3)

Investigates how budgeting canbe used to review, analyze, and establishpublic 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 issues and establish 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 complex environment. It includes a consideration of the administrative and behavioral as wellas the economic dimensions offinancing public organizations. 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: tax and nontaxsources of revenue; intergovernmental fiscal relations; debt management;
productivity; rate analysis; cash flow management; and managing fis cal retrenchment.

## PA 587 - Principles and Practices of Emergency Management (3)

Explores the history, doctrines, and authorities of emergency management as wellas the role ofthe 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-Listedas:This is the same course as EMCR 587 and may be taken only once for credit.

## PA 590 - Human Res ource Management in the Public Sector (3)

Administration and management of human resource systems in public sector and nonprofit organizations. Focus is on the underlying values ofhuman 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 system concepts 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. Emphasis 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 forPA 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 associated with the employment process from recruiting through termination or retirement and its overallpolicy impact on the practice of human resource management (HRM). Such areas entail federal, state and locallegislation 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 from those 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 organizational context, including volunteer programplanning, 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 is sues on a regular basis. They manage a diverse workforce with civil rights considerations central to effective human resourcemanagement. That diverse workforce serves increasingly diverse communities. Civil rights include race and ethnicity, but other issues and groups as well. This course considers the major issues of civil rights froma public law pers pective with a concern for the challenges facing public managers.

## PA 594 -Enhancing Diversity in the Workplace (3)

To examine the effects ofdiversity across organizations 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 divers ity is sues, to include but not limited to race, gender, age, nationality, class, language, sexual orientation and disability, will be dis cussed. 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 history 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 historical context for labor relations and a set of precepts for working with labor organizations 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 organizations that represent the employees of those organizations.

## PA 596 - Public Sector Collective Bargaining: Negotiations and Impasse Res olution (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, schooldistricts, and higher education. A mock negotiation case will be bargained. This course will also deal with the process of mediation, fact-finding, and interest arbitration.

Prerequisite: PA 595..

## PA 598 -Values-basedManagement I (3)

Introduces the model of values-based management as a method to enhance compatibility between the individual and the org anization that is essential for decis ion-making and supervision, particularly in nonprofit organizations. Students will develop a theoretical understanding of the elements of effective supervision and of the impact that a director/supervisor has on the human res ource system in their organizations. Students will work through the process of clarifying agency mission, 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.)
Cross-Listed as:HSMP 509.

## PAH 543 -Culture and Health Care (3)

The course is designed to providean 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 graduateprograms in the Division ofPublic Administration 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 issues 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 administration. 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 organizations 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 413 - Ethics and Public Policy (4)

An examination of the normative dimensions of public policy, focusing both on theethical is sues raised by the means of policymaking as well as the values that might shape the ends of public policy.

Also offered for graduate-level credit as PAP 513 and may be taken only once for credit. . Prerequis ite: 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)

Profess ional development planning works hop for students enrolled in the Master of Public Policy program. Students work with faculty to prepare a professional development plan, including careergoals, 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 forstudents enrolled in the Master of Public Policy program. Options include a researchoriented report or a client report linked to a short internship or placement experience.
Prerequis ite: 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 is sues are all part of the domain. The course will introduce students to a number of current policy is sues.

## 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 513 - 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 wellas the values that might shape theends of public policy.
Also offered for undergraduate-level credit as PAP 413 and may be taken only once for credit. .

## PAP 514 - Ins titutional 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 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 - Selected Studies (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 organizations, the interaction oforganizations 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 fornew approaches and substitutes to government; accelerated blurring of sector boundaries; increasing use ofthird party providers; and non-political boundaries.

Prerequisite: admission to the $\mathrm{Ph} . \mathrm{D}$. programin public adminis tration and policy..

## PAP 615 - Adminis trative Process (3)

The purposeof this course is to explore the nature of the adminis trative process and its relationship to organizational structure, process, and behavior with in the broader context of programmatic and
organizational governance. Emphas is 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 adminis trative process on the way in which agencies formulate and implement policy with in the context of their respective leg is lative mandates.
Prerequisite: admis sion to the Ph.D. programin public adminis tration 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: problem definition, 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: admis sion to the Ph.D. programin public adminis tration 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 politicalscience.

## PAP 621 - Comparative Political Institutions (3)

This course examines the performance, capabilities, and overall function of governments worldwide. Emphasis on advanced analyses of theories and concepts in comparative politics, with a particular focus on institutions of thestate.

## 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, realism, and radicalism; analytical and methodological perspectives, like behavioralismand rational choice theory; as well as the normative, critical, and postmodern challenges to the mainstream.

## PAP 645 - American Foreign Policy (4)

A seminar that explores different kinds of international dis putes and actual conflicts in order to identify and assess theories, analytical frameworks, and methods of conflict res olution, management, and prevention. Emphas is 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 analysis as a practiceof creating, assessing, and communicating information that is useful for understanding and improving policies. Theoretical methods of problemstructuring, forecasting, recommending, monitoring, evaluating, and improving policies.

## PAP 654 - Policy Analysis Research (3)

Contact the department for a description for this course.

## 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 disabilities. This course can also be used to make accommodations for students enrolled in other PE
courses who have health or injury conditions which impact regular participation in the course.

## PE 101 - Gentle Yoga (1)

This course is designed for students who need a slower-paced, les rigorous class: those with health is sues, including but not limited to injuries, pregnancy, chronic illness; those who have not or do not exercise on a regularbas is. 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 nonthreatening atmosphere. 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 restorative yoga, somatics, yoganidra 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, discovering inner res ources for peace of mind, healing, creativity, and calming of spirit. Meditation is a universal, health-giving resource used for hundreds 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 ofsix, 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 yoga means union, to bring together the mind, body, and spirit. There are eight aspects of yoga: Yama (universalmoral commandments), Niyama (personal disciplines), As anas (practice of the poses), Pranayama (rhythmic controlled breathing), Pratyahara (withdrawal of the senses), Dharana (concentration), Dhyana (meditation), and Samadhi (a state of super-consciousness orbliss). This course will explore these differentaspects 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 influentialChinese martial arts (Wu Shu). It is composed ofslow, gentle and constant body movements. This 24 -posture TaiChiChuan formis based on Yang style TaiChi, also known as a moving meditation. Practitioners perform a 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 ${ }^{\circledR}$ program is all about. It's an exhilarating, effective, easy-to-follow, Latin-inspired, calorie-burning dance fitness-party ${ }^{\text {TM }}$ that's moving millions of people toward joy and health. Zumba Fitness ${ }^{\circledR}$ is the only Latin-inspired dance-fitness programthat blends red-hot international music, created by Grammy A ward-winning producers, and contagious steps to forma "fitness-party" that is downright addictive. Since its inception in 2001, the Zumba programhas grown to become the world's largest - and mostsuccessful- dance-fitness program with 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 traditionalballet barre choreography to create a fun, high-energy sculpting class that tones, strengthens and stretches theentire body uniformly. This class challenges the body's range of motion with balance work, high repetitions, weights, balls and bands. Much ofthis 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 dancebeats 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 strength 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 theultimate workout for cardio 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 exercis es. 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-led exercise 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 stairclimbing. This is an advanced level class, but modifications are available. When the weather is nice, the class goes outside.

## PE 125 - Body Sculpt (1)

This course emphasizes muscular endurancetraining for the upper body, lowerbody, and abdominals. In a typical session, we use dumb bells, soft weights, tubing, steps, small medicine balls, and body res istance to challenge every major muscle group in the body. This class is an excellent choice for participants who getplenty 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 freedom to select the activity, day and time fromthe 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 theentire term. The choice is completely up to themand theirschedule(s). Simply select the des ired activity, check with the instructor 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 technique and 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 transform your body to an entirely new fitness level. Each class ses sion 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, resistance 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 thesport/event involved. This is a high intensity exercis e 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 enduranceactivities to enhance weight loss goals. The class will incorporate squats, lunges, stair climbing, running, jumping, side stepping, push-ups, and dips, in a wide variety of combinations to preservemuscle mass while you lose weight.

## PE 135-Pilates 1: Streng th andForm (1)

Students learn the structure, techniqueand formof Pilates, while awakening and strengthening the deep muscular skeletal system.

## PE 136 - Pilates Fusion (1)

Combining The Pilates formwith aspects of internal martial arts, yogaand releasetechnique, 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 formwith aspects of internal martial arts, yogaand releasetechnique, students learn to activate their center through complex movement 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, vulgar 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 stress, the trick is learning to harness and focus all that power into one's defense by using tools that don't require size or strength forthe average person. Preferred strategy: remain cognizant of surrounding at all times. This increas es our chance of being successful and fluctuates fromday 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 your strength, agility and overall aerobic capacity. Judo utilizes virtually every muscle of the body and is an excellent overall conditioner. This discipline promotes a confidencethat 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 most effective martial art in the world." The form of Jiu-Jitsu the Brazilians created is a Martial Art that is designed to adapt to any typeofFighting Style or Martial Art, making it reality based. This is a tested and proven style, art, and science. With the arrival of Brazilian Jiu-Jitsu on the martial arts scene, it has forever changed the way fighters train. Brazilian JiuJitsu offers a complete systemofself-defense that works whetheryou are big and strong or small of frame. Because of the principles of leverage that Brazilian Jiu-Jitsu is foundedupon, 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 basic 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 improvisationaldance, with endless possibilities for expressing the music. A true social dance, based on the art of leading and following, students will find it to be ever exciting, 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 classical tango orchestras as well as popular alternative tango music. Variations of movement and the depth ofemotion and
expres sion will be explored in traditional tango, fast paced playful Milonga, and the elegant Vals. Tango is a dance of presentmoment connection andzen, highly addictive, and a worthwhile adventure

## PE 161 - Swing 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 room for improvisation and selfexpression. Using many rhythmvariations, syncopations, slides, and stops, West Coast swing allows dancers a lot of freedom to play with their own personality 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 emphasis 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: Waltz, 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 neces sary posture, technique styling to create each dance style developed for expressing themusic. Students will learn mini-routines in each dancestyle taught for socialdancing success and students may choose to showcase what they learn and performat local venues, sharing the joy of ballroomdance with others

## PE 164 - Sals a and Social Latin (1)

An introduction to Salsa social Latin dancing. Focuses primarily on the popular social dance styles of today, including Salsa, Bachata, Cha-Cha, Merengue and Cumbia. Des igned to bring success in social dancing. Emphasis on ?Club styling? used for the smaller, crowded, dance floors and the basic
rhythmvariations 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 themas 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: asphalt, 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 cardiovascular fitness while burning calories. Bas ic hiking principles, selecting appropriate paths for ability levels, and progression of difficulty will be the cornerstoneof 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 also focus 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 Ins truction: 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. 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 theentire term. The choice is completely up to themand theirschedule(s). Simply select the desired activity, check with the instructor 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 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 sequenceofthree: Per 101, Per 102, and Per 103.

## Per 103 -First-Year Persian Term3 (4)

Introductionto 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 Term 1 (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 prerequisite: Per 103.

## Per 202 -Second-Year Persian Term2 (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 prerequis ite: Per 103.

## Per 203 -Second-Year Persian Term3 (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 oftwo: 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 sequence of two: Per 301 and Per 302. Recommended prerequis ite: 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, hand icrafts, 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 -Res earch (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 prerequisite: high school algebra.

## Ph 102 -Essentials of Physics (4)

An elementary introduction to the basic principles of phys ics, the ir interpretation and application. Designed to accommodate all liberal arts students. This is the second course in a sequenceoftwo: Ph 101 and Ph 102 . Concurrent enrollment in Ph 104, 105 is encouraged. Recommended prerequis ite: high schoolalgebra.

## Ph 104 -Experimental Investigations for Nonscience Majors (2)

Discovery labs fores 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 first course in a sequence oftwo: 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 Nonscience Majors (2)

Discovery labs fores 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 sequenceof two: Ph 104 and Ph 105 . One two-hourdiscussion and laboratory period. Concurrent enrollment in Ph 101, 102 is encouraged. Recommended prerequis ite: high school algebra.

## Ph 121 - General Astronomy (4)

An introductory historical, descriptive, and interpretative study of as tronomy. Emphas 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. 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 astronomy. 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 oflife 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 oftwo: 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 sequence of three: $\mathrm{Ph} 201, \mathrm{Ph} 202$, 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: $\mathrm{Ph} 201, \mathrm{Ph} 202$, 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 sequenceof 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 for students 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, 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 Phys ics (with Calculus). This is the second lab in a sequence of three: $\mathrm{Ph} 214, \mathrm{Ph} 215$, and Ph 216 . One 3-hour laboratory period.

Prerequisite: Concurrent enrollment in $\mathrm{Ph} 202, \mathrm{Ph}$ 212, 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: $\mathrm{Ph} 214, \mathrm{Ph} 215$, 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 thermodynamics, and optics using the methods of calculus. This is the third course in a sequence of three: $\mathrm{Ph} 221, \mathrm{Ph} 222$, and $\operatorname{Ph} 223$ 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 general physics 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: $\mathrm{Ph} 231, \mathrm{Ph} 232$, and Ph 233 and it is recommended they be taken in this order.

Prerequisite: Mth 112 or Mth 251 or Aleks Placement Test score 76 orhigher.. 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 medicalapplications. 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 or Ph 232. Corequisite: Ph 216.
Ph 234 -Lab for General Physics I with Life Science andMedical 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 thermal physics. This is the first course in a sequence of three: $\mathrm{Ph} 234, \mathrm{Ph} 235$, and Ph 236 and it is recommended they betaken 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 andMedical 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 andMedical Applications (1)

This is a general physics lab course with a focus on life science and medical applications. Students conduct lab exercis es exploring waves and optics. This is the third 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 233.

Ph 274 - Workshopfor PH 231 General Physics I with Life Science andMedical 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 Science andMedical 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 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 ofs tudents in $\mathrm{Ph} 231, \mathrm{Ph} 232$, 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 $\mathrm{Ph} 201, \mathrm{Ph} 202$, Ph 203 general physics sequence. Concurrent enrollment: corres ponding lecture course $\mathrm{Ph} 201, \mathrm{Ph}$ 202, Ph 203. Pass/no pass 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 $\mathrm{Ph} 201, \mathrm{Ph} 202$, Ph 203 generalphysics sequence. Concurrent enrollment: corres ponding lecture course $\mathrm{Ph} 201, \mathrm{Ph}$ 202, Ph 203. Pass/no pass 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 $\mathrm{Ph} 201, \mathrm{Ph} 202$, Ph 203 general physics sequence. Concurrent enrollment: corres ponding lecture course $\mathrm{Ph} 201, \mathrm{Ph}$ 202, Ph 203. Pass/no pass 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 $\mathrm{Ph} 211, \mathrm{Ph} 212$, Ph 213 OR Ph 221, Ph 222, Ph 223 general physics sequence. Concurrent prerequisite: corresponding lecture course Ph 211 or $\mathrm{Ph} 221, \mathrm{Ph} 212$ or Ph 222 , Ph 213 or Ph 223. Pass/no pass 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 $\mathrm{Ph} 211, \mathrm{Ph} 212$, Ph 213 OR Ph 221, Ph 222, Ph 223 generalphysics sequence. Concurrent prerequisite: corresponding lecture course Ph 211 or $\operatorname{Ph} 221$, 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 $\mathrm{Ph} 211, \mathrm{Ph} 212$, Ph 213 OR Ph 221, Ph 222, Ph 223 generalphysics sequence. Concurrent prerequisite: corresponding lecture course Ph 211 or $\mathrm{Ph} 221, \mathrm{Ph} 212$ or Ph 222 , Ph 213 or Ph 223. Pass/no pass 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 quantum mechanics. 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, digitallogic circuits with applications to experimental control and computer interfacing, and analog circuits. Two 3hour 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 electricalmeasurements, digitallogic circuits with applications to experimental control and computer interfacing, and analog circuits. Two 3hour lab periods. This is the second course in a sequence of three: Ph 314 , Ph 315 and Ph 316.

## Ph 316 - Experimental Physics III (4)

Students will performseveralexperiments illustrating quantumand relativistic effects. The emphasis will be on computer-assis ted experimentation and data
analys is. Experiments will include instrumentation and counting in nuclear physics, measurement of band gap in semiconductors, measurement 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: Ph 314 , Ph 315 and Ph 316. Expected preparation: Ph 311.

## Ph 319 -SolidState Physics for Engineering Students (4)

Survey of solid state physics including topics neces sary for understanding crystalline solids and their electron transport processes. Topics include crystal lattices, x-ray diffraction, concepts of quantumphysics, the Schrodinger equation, electron tunneling, physicals tatistics, the free electron theory of metals, periodic potentials, semiconductors, and superconductors. Recommended prerequis ite: Ph 213 or 223.

## Ph 321 -Current Electricity (4)

Electric potential and current; Kirchoff's Laws and equivalentcircuits. Transient and A.C. behavior of circuit elements. Theory of operation ofdiodes and trans is tors. 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 illus trating 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 physicalscience.

## Ph 333U- Weather (4)

Introductory course in the atmospheric environment providing a comprehensive unders tanding of
atmospheric structure and the changes over time that result in the weather we experience. Topics include: atmospheric mo is ture (fog, rain, clouds), atmospheric stability and cloud development, air pressure 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 from it, resulting in pathological, junk, pseudo and fraudulentphysics. Examples such as magnetic therapy, perpetual motion, ESP, X-ray cures, and astrology are included. Recommended prerequisites: upperdivis ion standing.

## Ph 337 -Physics in Biomedicine (4)

The physics behind the most important medical instruments and technologies. A wide range of concepts fromelectromagnetism, optics, to quantum mechanics are used to explain the mechanisms behind ultrasound, endoscopy, optical microscopy, EKG, pacemaker, defibrillators, LASER eye surgery, microscopy, x-ray, radiation, CAT scan, PET scan, MRI, and more. Expected preparation: 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 tis sue, 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 power generation, waste disposal and nuclear disasters; medical x-rays and nonionizing 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 forcredit..

## Ph 361U-General Astronomy I (4)

An introduction to the history of as tronomy, the nature of light, teles copes, 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 362U.

Cross-Listedas: Sci315U.

## Ph 362 U- 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 sequenceoftwo: Ph 361 U and Ph 362U.

Cross-Listedas: 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, generalphysics, 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 complexsystems. Includes laboratory and/or fieldwork. Recommended prerequisite: general physics or Natural Science Inquiry.

## Ph 367U-Complexity and the Universe II (4)

Continuation of Sci 318/Ph 366. Emphasizes scientific cosmology with a focus on understanding how insights gained from physics and as tronomy 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: astronomy, general physics, 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. Computersimulations and the use of microcomputers, desktop experiments are
an essential part of the course. Recommended prerequis ite: 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. Emphas izes 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 (emissions of carbon dioxide) and by the increasing concentrations of other "greenhouse gases"; how the ozone layer can be depleted by manmade 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 science fiction literature to examine a wide variety of topics in science. Recommended prerequisites: as tronomy, general physics, or Natural Science Inquiry. Also listed as Sci 355 ; course may be taken only once for credit.

## Ph 382U- Introduction to Nanoscience and Nanotechnology (4)

Basic introduction to nanoscienceand nanotechnology for all interested science, engineering and social science and humanities students. This is the same course as Sci 382 U and may be taken only once forcredit.

Cross-Listed as: Sci 382U.

## Ph 384 -From Contemporary Nanoscience

 Towards Sus tainable Nanotechnologies (4)Provides an overview of nanoscience/technology, its interdis ciplinarity, 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 382 U (cross listed Sci382U), it provides a scientific/technologicalbasis for sustainable future technology developments.
Cross-Listedas: This is the same course as Sci384 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 -Selected Topics (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 Schrodinger equation and its application to time-independent problems (both oneand three-dimensional problems); identical particles; approximation methods including mainly timeindependent perturbations. Briefexploration of the potential applications of quantummechanics to engineering: quantumnano-structures and quantum computers. Expected preparation: Ph 318 or 311 , Mth 256.

Also offered for graduate-level credit as Ph 511 and may be taken only once for credit..

## Ph 412 - Quantum Mechanics II (4)

Introduction to the three-dimensionalSchrodinger 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 quantummechanics, 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 for credit.. Prerequisite: Ph 411, 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 particular emphas is on the properties of electrons in metals. Expected preparation: Ph 411 or Ph 312.
Also offered for graduate-level credit as Ph 513 and may be taken only once for credit. .

## 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. Central forces, 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 dynamics. Theory of small oscillations, coupled oscillations and normal modes. Expected preparation: Ph 424 and Mth 256.

Also offered for graduate-levelcredit as Ph 525 and may be taken only once for credit. .

## 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; clas sical and quantumstatistics; introduction to statistical mechanicalensembles. 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 forcredit. .

## Ph 431 -Electricity and MagnetismI (4)

Advanced study of electricity and magnetism covering 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, displacement current, dielectrics and their microscopic models, electromagnetic waveequations, boundary conditions, energy radiation, magnetic materials and their microscopic models. This is the first course in a sequence oftwo: 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 forcredit..

## Ph 432 - Electricity and Magnetism II (4)

Advanced study of electricity and magnetism covering 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, displacement current, dielectrics and their micros copic 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 forcredit. .

## Ph 434-Methods of Mathematical Physics (4)

A survey ofmethods 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. Expected preparation: Ph 312 and Mth 256.

Also offered for graduate-level credit as Ph 534 and may be taken only once forcredit. .

## 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 extrinsic semiconductors, quantitative treatment of $\mathrm{p}-\mathrm{n}$
junction, diffusion and recombination of excess carriers, quantitative treatment of electron injection, majority and minority components ofthe junction current, breakdown, quantitative treatments ofbipolar junction transis tor, field effect transistor and tunnel diodes, physics of metal-semiconductor and metal-insulator-semiconductor junctions and devices, superconductivity and superconducting devices, DC and ACJosephsoneffects, Josephson junctions, superconductive quantuminterference 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 ass istedelectron emission, electron scattering and mobility of charge carriers, intrinsic and extrinsic semiconductors, quantitative treatmentof 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 ofbipolar junction transistor, field effect transistor and tunnel diodes, physics of metal-semiconductor and metal-insulator-semiconductor junctions and devices, superconductivity and superconducting devices, DC and ACJosephson effects, Josephson junctions, superconductive quantuminterference devices. This is the second course in a sequence oftwo: 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 anddiffusion, oxidation, defects, heterogeneous chemical reactions, thermodynamics and kinetics ofbasic processes such as diffusion and oxidation. These concepts are applied both to IC and photovoltaic device fabrication. 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 graduate-level credit as Ph 545 and may be taken only once for credit. . Prerequisite: Ph 314 or 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 issues 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 thatcome into play at these dimens ions 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 forcredit.. Prerequisite: Ph 445 or Ph 545 orconsent of instructor..

## Ph 447 -Microelectronic Device Fabrication III (4)

The third part ofthis series starts with the techniques required to pattern the nanoscale structures on wafers. These techniques include electron beam, $\mathrm{x}-$ ray, EUV, and photolithography, including discussion of resisttechnology. This is followed by methods to produce these structures using wet and dry methods. Discussion ofdry 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 forthis class will involve fabrication of a virtualdevice (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 forcredit.. Prerequisite: Ph 446 or Ph 546 orconsent of instructor..

## Ph 451 -Electron Microscopy (4)

Electron optics theory, specimen preparation and experimental work with transmission 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 oneyear of any other science.
Also offered for graduate-level credit as Ph 551 and may be taken only once forcredit. .

## Ph 452 -Electron Micros copy (4)

Electron optics theory, specimen preparation and experimental work with transmission 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 second course in a sequence of two: Ph 451 and Ph 452 . Expected preparation: one year ofgeneral physics and one year of any other science.

Also offered for graduate-level credit as Ph 552 and may be taken only once forcredit. .

## Ph 464 -Applied Optics (4)

An overview ofoptics and such principal application as fiberoptics; chemical, biological, and physical sensors; optical information processing, acoustooptics; lasers anddetectors. This course is the same as ECE 594; 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 forcredit.

## Ph 471 -Physical and Human Dimensions of Climate Change (4)

A holistic course onglobal changescience connecting atmo spheric 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 graduate-level credit as Ph 571 and may be taken only once forcredit.. Prerequisite: Ph 211, 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, solar energy, nuclear fission and fusion), their characteristics, utilization and technology as well as environmental and public impact. Special attention
will be given to photovoltaics and solar cell 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 access online materials in stellar as tronomy education to help current and prospective science teachers update their knowledge of recent developments in astronomy. Expected preparation: one year ofgeneral physics.
Also offered for graduate-level credit as Ph 575 and may be taken only once forcredit..

## Ph 476-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. Expected preparation: one year of generalphysics.

Also offered for graduate-level credit as Ph 576 and may be taken only once forcredit..

## Ph 477 - Air Pollution (4)

Air pollution meteorology needed to understand air pollution, atmospheric dispersion models, K-theory, box models and receptor models. Use of 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 differentialequations.
Also offered for graduate-level credit as Ph 577 and may be taken only once forcredit..

Ph 481 - Introduction to Nano(materials)-Science and-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 advancedupper divis ion science courses dependenton major, or consent of instructor.

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, organization, structure, and function at the cellular and molecular level. Atomic and molecular structures, energy and interacting forces relating to cellularand 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-levelcredit as Ph 590 and may be taken only once forcredit. .

## 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 the cellular and molecular level. Atomic and molecular structures, energy and interacting forces relating to cellular and molecular biophysics will be discussed. This is thesecond course in a sequence oftwo: 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 and Physical Properties of Ordered and Dis ordered Condensed Matter (4)

Introduction to materials physics. Generalized geometric-structural crystallography is at the core of this field because it allows for the derivation of the phys ical properties of condensed matter. Crystallographic symmetries are treated as continuous features. Quantitative X-ray diffraction, crystal defects, textures, modulated structures, and quas icrystals are also discussed.
Also offered for graduate-level credit as Ph 595 and may be taken only once forcredit. . 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 413 -Introduction to SolidState Physics (4)

Experimental and theoretical survey of the lattice and electronic properties of solids with particular emphas is 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 for credit.. Prerequisite: Upper division standing.

## 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 Schrodinger equation and its application to time-independent problems (bothoneand three-dimensional problems); identical particles; approximation methods including mainly timeindependentperturbations. Briefexploration of the potential applications of quantummechanics to engineering: quantumnano-structures and quantum computers. This course is the same as ECE598 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 quantummechanics, 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 orMth 322.
Also offered for undergraduate-level credit as Ph 412 and may be taken only once for credit.. Prerequisite: Ph 511, 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 particular emphas is on the properties of electrons in semiconductors and modern materials. Expected preparation: Ph 411 orPh 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 physical optics. One 4-hour laboratory period.
Also offered for undergraduate-level credit 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 dynamics. Theory of small 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 oftemperature, work, and heat; first and second laws ofthermodynamics 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-level credit as Ph 426 and may be taken only once for credit. .

## Ph 531 -Electricity and MagnetismI (4)

Advanced study of electricity and magnetism covering 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 oftwo: Ph 531 and $\operatorname{Ph} 532$.
Also offered for undergraduate-level credit as Ph 431 and may be taken only once for credit. .

## Ph 532 -Electricity and MagnetismII (4)

Advanced study of electricity and magnetism covering 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, 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 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 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 ass istedelectron emission, electron scattering and mobility of charge carriers, intrinsic and extrinsic semiconductors, quantitative treatmentof $\mathrm{p}-\mathrm{n}$ 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 transis tor, field effect transistor and tunnel diodes, physics of metal-semiconductor and metal-insulator-semiconductor junctions and devices, superconductivity and superconducting devices, DC and AC Josephsoneffects, Josephson junctions,
superconductive quantuminterference 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 necessary for understanding offunction, 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 assisted electron emission, electron scattering and mobility of charge carriers, intrinsic and extrinsic semiconductors, quantitative treatmentof $\mathrm{p}-\mathrm{n}$ 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 transis tor, field effect trans istor and tunnel diodes, physics of metal-semiconductor and metal-insulator-semiconductor junctions and devices, superconductivity and superconducting devices, DC and AC Josephson effects, Josephson junctions, superconductive quantuminterference devices. This is the second course in a sequence oftwo: 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 ofbasic processes such as diffusionand oxidation. These concepts are applied both to IC and photovoltaic device fabrication. 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-level credit as Ph 445 and may be taken only once for credit. .

## Ph 546-Microelectronic Device Fabrication II (4)

The emphasis ofsecond 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 ofnanoscale devices and specialeffects thatcome into play at these dimens ions will be examined. Assignments will include computer simulations of device fabrication (i.e., virtual fab software).

Also offered for undergraduate-level credit 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 resisttechnology. This is followed by methods to produce these structures using wet and dry methods. Discussion ofdry 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 experimentalwork with transmission 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 551 and Ph 552.
Also offered for undergraduate-level credit as Ph 451 and may be taken only once for credit. .

## Ph 552 -Electron Microscopy (4)

Electron optics theory, specimen preparation and experimental work with transmission 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 second course in 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, acoustooptics; 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 onglobal changescience connecting atmo spheric 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 undergraduate-level credit as Ph 471 and may be taken only once for credit.. Prerequisite: Ph 211, 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. Desktop experiments and computersimulations 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 cover the major resources of alternative energies (hydropower, wave, tidal and wind energy, solar energy, nuclear fission and fusion), their characteristics, utilization and technology as well as environmental and public impact. Special attention will be given to photovoltaics and solar cell technology. Market developments will also be analyzed based on simple models.

Also offered for undergraduate-level credit 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-onactivities 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. Use of 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-level credit as Ph 477 and may be taken only once for credit. .

Ph 581 - Introduction to Nano(materials)-Science and-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.

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 systems; 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 them in 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 crystals; 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 practiceof the instruments. This is the first course in a sequence of two: Ph 585 and Ph 586.

Prerequisite: admission to $\mathrm{Ph} . D$ programin Applied Physics, M.S. in Physics, or ESR Ph.D programs..

## Ph 586 - Experimental Methods in Applied Physics (4)

Introduction to modern instrumentation used in applied physics, focusing on nanoscience and materials, atmospheric physics, and biophysics, including theory and practiceof the instruments. This is the second course in a sequence of two: Ph 585 and Ph 586.

Prerequisite: admission to $\mathrm{Ph} . \mathrm{D}$ 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, organization, 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, organization, 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 thesecond course in a sequence of two: Ph 590 and Ph 591.

Also offered for undergraduate-level credit as Ph 491 and may be taken only once for credit. .

## Ph 595-Materials Physics: Structure and Physical Properties of Ordered and Dis ordered

 Condensed Matter (4)Introduction to materials physics. Generalized geometric-structural 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 quas icrystals are also discussed.

Also offered for undergraduate-level credit 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, $\mathrm{Ph} 432, \mathrm{Ph} 434$, 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 -Diss ertation (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 -Selected Topics (1-9)

(Credit to be arranged.)

## Ph 617 -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-dependenttheory 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 ofdensity matrices; Berry's phase; quantum theory 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 first course in a sequence of three: $\mathrm{Ph} 617, \mathrm{Ph} 618$, and Ph 619.
Prerequisite: $\mathrm{Ph} 411 / 511, \mathrm{Ph} 424 .$.

## 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-level problemand its application to laser operation. Dirac's formulation using bra and ket; differenttime-evolution pictures; concept ofdensity matrices; Berry's phase; quantum theory 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 second course in a sequenceof 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 Schrödinger equation; scattering theory in terms of stationary unbound states; time-dependenttheory 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; quantum theory of angular momentum; Feynman's path integral formulation; introduction to relativistic quantummechanics; issues on the fundamental aspects ofquantummechanics 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: Ph 411/511, 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 offluids 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 forcredit.
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 thes ame 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: classicalelectron 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 thesame 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 quantumsystems; 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 quantumsystems; 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 Atmos pheric 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 chemis try of HO and O 3 and transport modeling. Recommended prerequisites: Ph 578.

## PHE - Public Health Education <br> 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 racialhealing and racial justice for health equity. This course will introducestudents 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 allupper-division classes in the major.

## PHE 252 - First Aid (4)

Emergency care forvarious 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, as sessment ofstress, and stress management techniques and strategies.

## PHE 295-Health Promotion/Disease Prevention

 (4)Examines scientific literature regarding lifestyle choices that promoteoptimalhealth and functioning. Behaviors regarding self-protection, self-care, and health promotion are compared to recommendations emerging from th is literature.

## PHE 299-Special Studies (0-4)

(Credit to be arranged.)

## PHE 314 - Res earch 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 and Murdered 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 from colonization, the long-termeffects of colonialism, and the social and system-level responses that serve to further dis empower 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 fromIndigenous
values, experiences, and perspectives to address this critical issue.

## 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 continuum of health-related topics fromthe classical 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 for credit.

Cross-Listedas: PAH 320U.

## PHE 321 U- 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 courseexamines 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 323 U- Intro to Fat Studies (4)

This course will use a social justice and critical pedagogy approach to examine the impacts of weight bias (sizeism) on individuals and society. We will center the voices and experiences of thoseliving in larger bodies and use an intersectional lens to analyze how we can effectively impact social determinants of health and well-being. Current innovative challenges to the weight bias paradigm will be explored along with ways that students can participate in this emerging movement.

## PHE 325U - Nutrition for Health (4)

Examines bas is 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 issues, 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 issues 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 dis parities in housing quality and type; interventions to improve housing and neighborhood health; and internationalmodels of housing. Public and private strategies to prevent or solve housing-related health problems will be emphasized.

## PHE 335U- Human Sexuality (4)

A survey of the psychological, physiological, and behavioral aspects of human sexuality, with particular emphasis on the influenceof popular culture on these dimensions

## PHE 340 - Motor Learning (4)

Introduction to the principles and practiceofmotor 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 ofteaching 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 351 U- Film and Health (4)

Critically explores public health is sues as they are portrayed in popular films and discusses the scientific, social, and politicalunderpinnings of the public health is sues portrayed in these movies. Covers diseases such as AIDS, hemorrhagic fever, MS, cancer, leukemia, and multiple chemical sensitivity fromboth biomedical and social perspectives. Guestspeakers fromthe community will contribute to the discussion.

## PHE 354U- Social Gerontology (4)

Addresses the social and ethical issues, problems, policies, and programs that affect the quality of life for our rapidly aging population. The interd is ciplinary field of gerontology offers students the opportunity to integrate biological, psychological, and socialtheories of aging. Also examines the economic and politicalimpacts of an aging society.

## PHE 355U- Consumer Health Is sues (4)

Identifies and critically analyzes is sues related to the production, marketing, and consumption of healthrelated goods and services. Media mes sages about consumer health issues 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 emphasis on student participation. Recommended prerequisites: $\mathrm{Bi} 301,302$.

## PHE 363 - Communicable Dis eas es and Chronic Health Problems (4)

Reviews etiology, epidemiology, and approaches to prevention of infectious and chronic diseases. Aspects of risk factors, transmission, pathogenesis, immunology, case management, and control programs are discussed. Basic human physiological processes are reviewed. Expected preparation: PHE 250.

## PHE 365-Health Promotion Programs for Children and Youth (4)

Provides an understanding of factors that influence 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. Whathealth 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: PHE270..

## PHE 399-Special Studies (1-6)

(Credit to be arranged.)

## PHE 401 - Res earch (1-8)

(Credit to be arranged.) Consent of instructor.

PHE 402 - Independent Study (1-8)
(Credit to be arranged.)

PHE 404 -Cooperative Education/Internship (115)
(Credit to be arranged.) A work related experience designed to connect and integrate theory with specific activities in a "real" environment under supervision. Field hours for students taking the internship will be 30 hours per credit perterm. Additionally, students will be expected to attend scheduled seminars.

## PHE 405 - Reading and Conference (0-6)

(Credit to be arranged.) Consent of ins tructor.

## 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) <br> (Credit to be arranged.)

## PHE 410 -SelectedTopics (1-8)

(Credit to be arranged.)

## PHE 410U-Selected Topics (4)

(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, wis dom, and healing.
Prerequis ite: Upper-division standing..
PHE 416 - Families and Aging (4)
Family ties of middle aged and older adults are explored using a life cours eperspective. 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.

Prerequis ite: juniorstanding..

## 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 cours ework in PHE.

## PHE 418-Lactation Education 1: Introduction to Human Lactation (4)

The first in the lactation education series. Students will develop skills to as sess 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 professional communication skills for the health care setting. This is the first course in a sequence of three: PHE418, 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 complexmaternal and infant breastfeeding challenges. Attention will be given to critically understanding andutilizing evidence-informed information to guide direct lactation support and communication with the health-care team. Students will deepen knowledge of useofreferrals and resources to support the parent-babydyad. 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 complex cas es including prematurity, medically fragile infants, and infants or parents with specialmedical or nutritional needs. Students will strengthen their understanding of the IBLCE Code of Profess ional 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: PHE 418, PHE 419, PHE 420 which must be taken in sequence.

Prerequisite: PHE419.

## PHE 421 - Health Coaching Strategies (4)

Concepts and techniques for work with individuals and groups on improving all areas of wellness including fitness, nutrition, weight, stress, and management of life issues that affect health. Program planning theories and models as well as practices for health education, including developing rapport, nonviolent communication, motivational interviewing and practice management. Students gain practical experience through live coaching demonstrations.

Prerequisite: Twelve hours of upper-division cours ework in PHE..

## 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 dis cussion of topics regarding systems, policy and organization in health services administration practice. Current is sues/events will be emphas ized. The course employs techniques that capitalize on group participation and peer-to-peer learning to stimulate sharing ofdiverse perspectives and increase the participants' level of engagement with historically marginalized viewpoints.
Prerequisite: PHE350.

## PHE 427 - Introduction to Health Informatics (4)

An introduction tohealth informatics, the field devoted to the optimaluse ofdata, information, and knowledge to advance individual health, health care, public health, and health-related res earch. 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 thestudent to understand and evaluate complexenvironmental 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 globalpublic health issues 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 issues may include such topics as reproductivehealth, violence, aging, heart disease, depression, and sexuality. The class is taught in an interactive format through group discussion, presentations, and the participation of group speakers. The course focuses on the consideration and critique of current influences on men's health including the effect of the health care system, male socialization, the impact of the social and cultural factors, and the influenceof evolving technology.

Also offered for graduate-level credit as PHE 545 and may be taken only once for credit..

## PHE 446U- Community Health Principles and Practices (4)

Provides an overview of the scope of problems in the field of community health. Examines disease prevention/control, community health service delivery, the structure ofofficial/unofficial agencies, and policy/decis ion-making processes. Course includes field work in a community health agency.

## PHE 448-Health Education Techniques and Strategies (4)

Introduces students to basic techniques and strategies used in planning and carrying out health education programs in a variety of settings. Special emphasis is given to scopeand sequencing skills, objective writing, selection/development of health education resources/materials, and methods for and use of technology in the delivery ofhealth education programs. Recommended prerequisite: PHE350.

## PHE 450 - Epidemiology (4)

Introduces principles and methods of epidemiological investigation of infectious/non-infectious diseases. 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 transmis sion, and pathogenesis of disease. Recommended prerequisite: PHE363.

## PHE 451 - Women and Holistic Health (4)

Exploring the intersection of three fields --allopathic medicine, women's health, and complementary therapies-- the course examines theemerging 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: PHE 295 or WS 101.
Also offered for graduate-level credit as PHE 551 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 social inequities 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 occurrenceofdisease.

## PHE 453 - Women's Reproductive Health (4)

Critical review of current public health and sociopolitical issues in women's reproductivehealth. Both national and international topics are discussed. Students apply health knowledge in identifying and seeking solutions to the issues which concern health care providers, consumers, and policy makers . Expected preparation:PHE 250 and PHE 335.
Also offered for graduate-level credit as PHE 553 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 issue. 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 social norms affect maternal and child health.

Also offered for graduate-level credit as PHE 554 and may be taken only once for credit.. Prerequisite: 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 res ponsible 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 with in allopathic medicine is examined as is research and practice in complementary fields of medicine and health care. Expected preparation: Psy 204, PHE 363.
Also offered for graduate-level credit as PHE 566 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 expandedunderstanding of human transformative capacities. Transformative practices including meditation, yoga, imagery, biofeedback, and sport are examined. Elements common to all trans formative practices are identified. Expected preparation: PHE466/566.

Also offered for graduate-level credit as PHE 567 and may be taken only once for credit. .

PHE 471 - Program Planning and Evaluation in Health Education: Theory and Skill Development (4)

Examines programplanning models for health education. Includes needs assessment; programgoals and objectives; program content and methodologies, evaluation, budgeting, and proposal writing. Students will gain practicalexperience in programplanning and evaluation through community-based learning. Field work required. Recommended prerequisite: twelve hours of upper-division coursework 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, circulores piratory, and environmental factors related to fitness and health.

Also offered for graduate-level credit as PHE 573 and may be taken only once for credit. . Prerequis ite: Bi 301 and Bi 302 or equivalent.. Corequisite: PHE 473L.

## PHE 473L-Physiology of Exercise Lab (0)

Physiology exercise lab.

## PHE 474 -Exercise Pres cription and Training (4)

Focuses on thebasic principles and skills needed for developing and implementing physical fitness programs. Emph as is includes: appropriate/ safe training procedures and the underlying principles which support such methods, applications to younger and older populations, gender differences, motivationals trateg ies and health behavior theory, and exercise leadership skills. A significant portion of the course involves experiential learning. Recommended prerequis ites: PHE 295, 473.

## PHE 475 - 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 neces sary for conducting tests on apparently healthy individuals. Assessment categories include anaerobic performance, muscular strength and endurance, flexibility, body composition, cardiovascular function.

Also offered for graduate-level credit as PHE 575 and may be taken only once for credit. . Prerequis ite: PHE 473, or consent of instructor.. Corequisite: PHE 475L.

PHE 475L-Exercise Testing Techniques Lab(0)
Exercise testing techniques lab.

## PHE 478 -Program Planning and Evaluation: Needs Ass essment and Interventions (4)

Examines programplanning theories and models for health education. Includes needs assessment; programgoals andobjectives; interventions; program content and methodologies, meas urement, and proposal writing. Students will gain practical experience in programplanning through communitybased learning. Field work required.This is the first course in a sequence of 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; res ource allocation, budgeting, marketing, evaluation design, data analys is and reporting. Students will gain practical experience in programplanning through communitybased learning. Field work required. This is the second course in a sequence oftwo: PHE 478 and PHE 479 and must be taken in sequence.
Prerequisite: PHE478..

## PHE 480 - Controversial Iss ues 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 prerequis ites: senior status and 12 credits ofPHE.

## PHE 501 - Res earch (1-6)

(Credit to be arranged.) Consent of instructor.

## 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 502 - Independent Study (1-8)

(Credit to be arranged.)

## PHE 503 - Thesis (0-15)

(Credit to be arranged.)

PHE 504-Cooperative Education/Internship (015)
(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 class include the mission of public health, the politics of public health, determinants of calth 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 thebiological, psychological, behavioral, sociocultural, and environmental factors that function in the promotion of health and prevention of disease. Theories developed to explain health andillness behaviors at intrapersonal, interpersonal, and group/community levels are introduced. Ethical
issues involved in health-related behavior change are examined. Satis fies the coreM.P.H. requirement. Expected preparation: graduate standing.

Also offered as PHE612 for doctoral students..
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 phys iological alterations related to physical activity; historical background of physical activity recommendations; measurementissues; communitybased 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 oftheoretical knowledge and practical skills of community organizing.

## PHE 518 - Topics in Health Studies (3)

In-depth analysis ofrecent research and related programdevelopments 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, environmental health, physical activity/exercise, and health of special populations. Recommended prerequisite: graduate standing.

## PHE 519 - Introduction to the Etiology of Dis ease (3)

The biologicaland 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. Essential characteristics of three major alternate paradigms (interpretivist, constructivist, and critical theory) are introduced. Validity, reliability, and related concepts are examined from the perspective 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 Res earch Design and Analysis (3)

Introduction to quantitative research design and statistical analysis. 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 theoretical foundations for social epidemiology; investigates the conceptualization and measurement 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 PHE 622 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 course forstudents interested in exploring is sues 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 phys iological and health-related effects of exercise on women. Emphasis on the responses and adaptations to exercise specific to women. Topics include gender differences, themenstrual cycle, pregnancy, menopause, and osteoporosis. Recommended prerequisite: PHE473/573.

## PHE 532 - 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 processes. It will explain epigenetics and other mechanisms which through priming influencelifelong health.

Also offered as PHE 632 to doctoral students..
PHE 534 -Social Epidemiology Methods \& Theory (3)

Surveys social epidemiology 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 as PHE 634 for doctoral students. Prerequisite: Epi 512 and Bsta 525..

## PHE 540 - Mass Media and Health (3)

Examine the use and effectiveness of mass media to both report the news abouthealth and to promote changes of action in health-related areas. Students will be required to critique media health mes sages regarding theirobjectivity and the extent to which they are comprehensive.

Prerequisite: PHE 512..

## 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 illustrate basic concepts and skills related to media advocacy. Topics covered include: gaining access to the news, framing issues froma public health perspective, and the use of paid advertis ing to advance policy. Content areas include tobacco, violence, handguns, suicide, alcohol, and other public health is sues.
Prerequisite: PHE 512..

## PHE 543 - Drugs, Behavior, and Society (3)

Emphas is will be placed on the relationship between drug and alcoholuse and a broad range of social circumstances associated with socio-economic status, race/ethnicity, and gender. Particular attention will be given to policy and service issues regarding the treatment and prevention of alcohol and drug abuse from a public health perspective. Recommended prerequisite: graduate standing.

## PHE 545-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 issues may include such topics as reproductivehealth, violence, aging, heart disease, depression, and sexuality. The class is taught in an interactive format through group discussion, presentations, and the participation of group speakers. The course focuses on the consideration and critique of current influences on men's health including the effect of the health care system, male socialization, the impact of the social and cultural factors, and the influenceof evolving technology.

Also offered for undergraduate-level credit as PHE 445 and may be taken only once for credit..

## PHE 546 - Urban and Community Health (3)

Examines the social factors associated with urban health and quality of life, such as social clas s, 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 fhealth 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 theemerging field of integrative medicine, highlighting the contributions that women care givers and healers have made to its development. Anoverview of common women's health concerns provides the opportunity to compare and contrast essential elements of holistic treatment approaches with those of allopathic medicine.

Also offered for undergraduate-level credit as PHE 451 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 is sues; reproductive health and sexuality; health care and access to health services; violence; mentalhealth 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 organization to evaluate women's health needs in Portland.

## PHE 553 - Women's Reproductive Health (4)

Critical review of current public health and sociopolitical issues in women's reproductive health. Both national and international topics are discussed. Students apply health knowledge in identifying and seeking solutions to the issues which concern health care providers, consumers, and policy makers.
Also offered for undergraduate-level credit as PHE 453 and may be taken only once for credit. .

## PHE 554-Maternal \& Child Health (4)

This course uses a dis cussion-based format to address maternal and child health as a public health issue. 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 undergraduate-level credit as PHE 454 and may be taken only once for credit..

## PHE 561 - Cultural Variations in Aging (3)

The aging population includes an increasing percentageof people from a 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 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: Dis ease Prevention

 (4)An investigation of the integral relationship between body and mind and how that relationship manifests its elf 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 ofmedicine and health care.

Also offered for undergraduate-level credit as PHE 466 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 sport are examined. Elements common to all trans formative practices are identified. Expected preparation: PHE466/566.

Also offered for undergraduate-level credit as PHE 467 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, circulores piratory, and environmental factors related to fitness and health.

Also offered for undergraduate-level credit as PHE 473 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 assessmentmethods/tools used to evaluate physiological function relating to fitness and health, including laboratory and field tests. Significant emphasis on developing skills neces sary for conducting 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 PHE 475 and may be taken only once for credit. . Prerequisite:PHE473, or consent of instructor.. Corequisite: PHE575L.

## PHE 575L-Exercise Testing Techniques Lab(0)

Exercise testing techniques lab.

## PHE 576 -Physical Activity, Health, and Disease

 (3)Review of current res earch to explore the relationship between physicalactivity/exercise and health/dis ease. Primarily investigates therole of physical activity in disease prevention, butalso examines the impact of a variety of physical conditions (e.g., obesity, aging, etc.) on the potential for an active lifestyle. Topics include cardiovascular diseases, mus culoskeletal dis orders, res piratory conditions, metabolic diseases, cancers, and mental health. Recommended prerequisite: PHE 473.

## PHE 577 -Exercise, Nutrition, and Performance

 (3)Review of metabolic processes and physiological mechanisms 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: PHE 473.

## 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 thebiological, 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 intrapersonal, interpersonal, and group/community levels are introduced. Ethical is sues involved in health-related behavior change are examined. Satis fies the core M.P.H. requirement. Expected preparation: graduatestanding.
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 meas urement ofdifferent social determinants ofhealth using a lifecourse approach; explores how the "embodiment" of social forces influence disease processes; and examines different actions (i.e., behavioral, clinical, social, legislative and political) used to eliminate health inequities within our local, national and international communities.

Also offered as PHE 522 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 about critical 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 Propos als (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 res earch design, measurement (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. Emphasis 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 proposal concepts.

## PHE 626 - Teaching and Learning in Health Promotion \& Social Work (3)

This course focuses on pedagogical theory and practice in profes sional settings. Students develop skills to design, evaluate, and implement effective curriculumand instruction across settings: academic classrooms, community contexts, and research projects. Topics include educational theory, course design, learning and teaching strategies, assessment, and scholarship of teaching and learning.

Cross-Listedas:SW 626.
PHE 632 - Developmental Origins of Health and Disease (DOHaD) - Epidemiology (3)
Covers the history of the DevelopmentalOrigins of Health and Dis ease (DOHaD) framework, the trends that drive and result from DOHaD processes. It will explain epigenetics and other mechanisms which through priming influence lifelong health.

Also offered for graduate-level credit as PHE 532..

## PHE 634 -Social Epidemiology Methods \& Theory (3)

Surveys social epidemiology practice including measurement, study design, analysis and translation for researching behavioral, social, economic, and cultural determinants of population dis tributions 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 PHE 534.. Prerequisite: Epi 512 and Bsta 525..

PHE 661 - Cultural Variations in Aging (3)
The aging population includes an increasing percentage of people froma variety ofethnic 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 PHE 561 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 willuse different materials --typically classical texts -- attention will be given to what makes a question a philosophical question and the nature and methods of philosophical inquiry.

## Phl 210 - Philos ophy of Religion (4)

Examination of philosophical 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 existence ofevil). 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 issues as they appear in literature, especially in fiction. The specific philos ophical problems and the literary works will vary 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 disproof central to philosophical reas oning, and of the fundamental concepts and distinctions employed in current philosophical dis course. 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 301 U- 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 Philos ophy (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 Is lamic authors.

## Phl 303U-Early Modern Philos ophy (4)

History of W estern philosophy during the Early Modern period (17th and 18th centuries) from Descartes 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 from Hegel to Nietzsche. Topics include post-Kantian idealism, the "social turn" in epistemology,
communitarian ethics, reactions to the cris is 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 practice of medicine such as: the relationship ofmedicine 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 ofdiagnostic categories in medicine and psychiatry.

## Phl 306U - Science and Ps eudos cience (4)

An examination ofbas ic issues 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 frompseudoscience? How are theories tested? When is evidence reliable? Must we invoke the supernatural to explain certain aspects of reality?

## Phl 307U- Introduction to the Philos ophy of Social Science (4)

A survey of philosophical is sues that arise within socialsciences: what is the object of study of the socialsciences, are socialsciences scientific, are there laws in social sciences, are social sciences descriptive or explanatory, and does the proper methodology of social sciences include unique hermeneutical principles of understanding or merely methods of causal inference and/or structural analys is?

## 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 rightacts 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 conceptof 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 adequate environmental ethic. Some of these is sues deal with how our treatment of the environmentaffects 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 properaims of punis hment; moral considerations that bear on the justice and wisdomofpunishment. 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 perspective.

## Phl 313U-Life and Death Issues (4)

Study ofmoral 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 aspects of new information technologies; are technologies value-laden; potential abuses and their social consequences; freedom, privacy, and control; security, reliability, and profes sional 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 include consciousness, (in)authenticity, alienation, death, anxiety, freedom, time, nihilism, 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 issues concerning thecreation, 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 relativismofaesthetic value judgments.

## Phl 318U- Philos ophy of Medicine (4)

Examination of central philosophical is sues that arise within the theory and practice of medicine such as: the relationship ofmedicine to basic sciences, the roles played in medicine by normative concepts such as health and illnes $s$, 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 from Hinduism, Buddhism, Taoism, and Confucianism. Topics include: the nature of reality, the self, causality, 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 thatare applied to case studies frompublic media such as editorials, essays, propaganda advertisements, and newspaper reports of scientific studies.

## Phl 321 U- Practical Epis temology (4)

Considers criteria for knowledge-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 artificial intelligence including its functionalistontology. Topics include the nature ofcomputation, learning, and intelligence and the role of consciousness in thinking and behavior. Expected preparation: 8 credits in any science or 8 credits in any philosophy courses.

## Phl 324U - Introduction to Formal Logic I (4)

A course in basic formal logic. Major topics include the method of deduction for showing propositional arguments valid and the method of counter-example for showing such arguments invalid. Truth table methods, tests for consistency, and syllogistic arguments are optional topics.

## Phl 325U- Introduction to Formal Logic II, Predicate Logic (4)

Continuation of Phl 324 Introduction to Formal Logic. Primary emphas is will be on formal methods for dealing with arguments involving the terms "all" and "some." Major topics include the method of deduction for showing predicate logic arguments valid, and the method of counter- example for showing such arguments invalid. Recommended prerequisite: Phl 324.

## Phl 327 - Introduction to Quantitative Literacy (4)

The goal is to learn to think intelligently and critically about important uses of quantitative databy means of discussion of the following topics: samples, measures, scales, relationships, risks, predictions, graphs, averages, percentages, distributions, random effects, and estimates. Intended for students who do not normally take classes that involve quantitative matters; its mathematical content 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 the role 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 leastonecourse 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 expression 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 or create law? Readings include classics ofjurisprudence (e.g., Austin, Hart, Dworkin) as well as judicialopinions in a selected topic. Recommended prerequisites: Phl 308,311 or 316.

## Phl 336 - Ancient Political Philosophy (4)

A study of central philos ophical themes (justice, power, citizenship, etc.) across major figures in ancient Greek and Roman political thought.

## Phl 344U- Military Ethics (4)

Examination of the central conceptual, ethical, and existential is sues 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 internationalrelations. Topics include military, humanitarian, and covert intervention, economic sanctions, development as sistance and human rights.

## Phl 351U- Philos ophy of International Human Rights (4)

Examination of concepts of human rights through classics of political philosophy, international human rights law and its development, and currenthighprofile cases of alleged violations of human rights.

## Phl 352U- Philos ophy of International Law (4)

Analysis of International Law through its philosophical foundations, majorhistorical forms of implementation, and currentroles in ameliorating global problems (e.g., war, poverty, and revolutions).

## Phl 355U- Morality and Health Care (4)

Examination of central issues of the ethics of health care such as euthanasia, abortion and equitable medical allocation.

## Phl 360U- American Philosophy (4)

Study of American pragmatismthrough 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- Atheis m (4)

Examination of atheis tphilosophy 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 is sues concerning sports. Topics include the nature and role ofsports 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 is sues emerging from a reflection on sexand love such as: possible essenceof heterosexuality, homosexuality, and asexuality; morality ofdifferent expres sions of sex and love such as sadomasochismand poly gamy; role of sexuality and romantic love in our selfconception; influence of conceptual sources on our experiences of sexuality and love.

## Phl 370U- Philos ophy of Work and Leis ure (4)

Role and nature of work and leisure in theories of the good life and central social and political practices.

## Phl 371U- Philos ophy 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 philosophical bases of contemporary urban theory including political, civic, sustainable, and aes thetic 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 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-Listedas: This is the same course as WS 373 and may be taken only once for credit..

## Phl 375U- Food Ethics (4)

An introduction to ethical issues 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 multid isciplinary 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
professional 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 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 essays, dialogues, and short stories to explore the diverse ways in which people have communicated philosophical ideas. This is a writing-intensive course 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 philosophy.

Also offered for graduate-level credit as Phl 514 and may be taken only once forcredit. .

## Phl 415 - Aris totle (4)

Study of some of the works of Aris totle, 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 Phl 515 and may be taken only once forcredit. .

## Phl 416 - The Rationalists: Descartes, Leibniz, Spinoza (4)

Study, with comparis ons, ofselected works of philosophers who maintained that knowledge comes primarily from reason. Likely readings: for Descartes, Meditations, or Rules, or Dis course on Method; forSpinoza, Ethics; for Leibniz, a selection from among his many collected works and fragments. Recommended prerequisite: 8 credits in philosophy.
Also offered for graduate-level credit as Phl 516 and may be taken only once forcredit. .

## Phl 417 - 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. Recommended prerequisite: 8 credits in philosophy.

Also offered for graduate-level credit as Phl 517 and may be taken only once forcredit. .

## Phl 419-Kant (4)

Study of Kant's Philos ophy primarily as represented in the Critiques of Pure Reason, Practical Reason, Judgment. Readings fromsome of these or related works. Possible topics for consideration: necessary connection, the analytic-synthetic distinction, conceptions ofscience 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 emphas is on the later work, especially the Philosophical Investigations. Attention will be given to Wittgenstein's contributions to philosophical method, as well as to his treatment of is sues concerning language, meaning, intention, understanding, necessity, and the nature of human persons as language users. Recommended prerequisite: 12 credits in philosophy.
Also offered for graduate-level credit as Ph1520 and may be taken only once forcredit. .

## Phl 423 -Metaphysics (4)

Philosophical examination of traditional metaphysical issues (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 dis cipline (logical positivismand its critics). Recommended prerequisite: 8 credits in philosophy.

Also offered for graduate-level credit as Ph 1523 and may be taken only once for credit. .

## Phl 424 -Epistemology (4)

Philosophical examination of some of the main issues in the theory ofknowledge (such as ourknowledge 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-levelcredit as Ph1 524 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 our knowledge of them. Main topics are dualism and various forms of physicalism, behaviorism, mind-body identity theories, functionalism and 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 prerequisite: 8 credits in philosophy.
Also offered for graduate-level credit as Ph 1533 and may be taken only once forcredit. .

## Phl 445-Advanced Ethics (4)

A course in moralepistemology or "meta-ethics" dealing with such matters as the distinction and connections between factand value, "is" and "ought," and description and evaluation. Recommended prerequisite: 8 credits in philosophy.
Also offered for graduate-level credit as Ph 1545 and may be taken only once forcredit. .

## 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 moral evaluation. Course may be repeated for credit toward major requirements with departmental approval. Expected preparation: Phl 308 or Phl 445.
Also offered for graduate-level credit as Ph 1546 and may be taken only once forcredit. .

## Phl 447 -Topics in Social and Political Philosophy

 (4)An in-depth study of an important current is sue (such as global justice, multiculturalism, orpower) or figure (such as John Rawls, Jürgen Habermas, or MichelFoucault) in social and political philos ophy. Course may be repeated for credit if topics are different.

Also offered for graduate-level credit as Ph 1547 and may be taken only once forcredit. .Prerequisite: Phl 316 U or junior-level standing or by instructor approval..

## Phl 448 -Biomedical Ethics (4)

Advanced study of central ethical is sues in medicine, biomedicalresearch, and health care systems, such as patient autonomy and medical paternalis $m$, justice in provision of health services, protection of fhuman subjects in research, and death, dying, and end of life care. Expected preparation: Phl 355.
Also offered for graduate level credit as Ph1548 and may be taken only once forcredit.. Prerequis ite: Upper-division standing.

## Phl 449-Philos ophy of Sus tainability (4)

Examination of the core philosophical issues that arise within the theory and practice of sustainability
and across its three complementary dimens ions: environmental, economic, and social.

Also offered for graduate-levle credit as Phl 549 and may be taken only once forcredit. . Prerequisite: junior standing.

## Phl 451 -Classical Figures (4)

Intens ive study of some classical figures such as Descartes, Spinoza, Leibniz, Nietzsche, Hegel. Course may be repeated for credit. Recommended: junior levelstanding.
Also offered for graduate-level credit as Phl 551 and may be taken only once for credit. .
Phl 460 -Contemporary European Philos ophy (4)
In-depth study of a current theme (such as phenomenology, post-modernism, or poststructuralism) or topical figure (such as Habermas, Derrida, or Benjamin) ofEuropean, "Continental" Philosophy.
Also offered for graduate-level credit as Phl 560 and may be taken only once for credit. . Prerequisite: Junior standing or consent of ins tructor..

## 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 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.
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 Philos ophy of Science (4)

An in-depth analysis ofsome specific metaphysical is sue pertaining to scientific epistemology such as (but not limited to) explanation, causation, realism, geometry, and relativism. Topics vary per course which will allow students to take course more than once, with departmental approval, to apply toward major requirements. Recommended prerequisites: 8 credits in philos ophy and upper-division standing.
Also offered for graduate-levelcredit as Ph1571 and may be taken only once forcredit. .

## Phl 474 -Philos ophy of Logic (4)

Topics: validity, sentence-proposition, connectives, quantifiers, truth, paradoxes, logicalnecessity and possibility. Optional topics: metalogic, the construction of formal systems of logic and formal proofs ofcertain of their properties, e.g., consistency
and completeness. Recommended prerequisite: Phl 325.

Also offered for graduate-level credit as Phl 574 and may be taken only once forcredit. .

## Phl 481 -Biomedical Ethics (4)

A three-termsequence thatprovides a practical bioethics education in clinical health care, biomedical and behavioral research, and public policy. Phl 481/581: introduction to the concepts, methods, and literature of health care and biomedical research ethics, designed to familiarize participants with the basic definitions and arguments in the major topics of clinical and research ethics. Phl482/582 and Phl 483/583: concepts and skills developed in 481/581 will be intensively examined; students take responsibility forseveral aspects of teaching. This is the first course in a sequence of three: Ph1481, Phl 482, and Phl 483 which must be taken in sequence. Recommended prerequisite: an acquaintance with health care services.

Also offered for graduate-level credit as Phl 581 and may be taken only once forcredit. .

## Phl 482 -Biomedical Ethics (4)

A three-termsequence thatprovides a practical bioethics education in clinical health care, biomedical and behavioral research, and public policy. Phl 481/581: introduction to the concepts, methods, and literature of health care and biomedical research ethics, designed to familiarize participants with the basic definitions and arguments in the major topics of clinical and research ethics. Phl 482/582 and Phl 483/583: concepts and skills developed in 481/581 will be intensively examined; students take responsibility for several aspects of teaching. This is the second course in a sequenceof three: $\mathrm{Phl} 481, \mathrm{Phl}$ 482 , and Phl 483 which must be taken in sequence. Recommended prerequisite: an acquaintance with health care services.
Also offered for graduate-level credit as Phl 582 and may be taken only once forcredit. .

## Phl 483 -Biomedical Ethics (4)

A three-termsequence thatprovides a practical bioethics education in clinical health care, biomedical and behavioral research, and public policy. Phl 481/581: introduction to the concepts, methods, and literature of health care and biomedical research ethics, designed to familiarize participants with the basic definitions and arguments in the major topics of clinical and research ethics. Phl482/582 and Phl 483/583: concepts and skills developed in 481/581 will be intensively examined; students take responsibility forseveral aspects of teaching. This is the third course in a sequence of three: $\mathrm{Phl} 481, \mathrm{Phl}$

482, and Phl 483 which must be taken in sequence. Recommended prerequisite: an acquaintance with health care services.

Also offered for graduate-level credit as Phl 583 and may be taken only once for credit. .

## Phl 485 -Honors Seminar (4)

Selected topics within areas of the ins tructor's res earch. Students will be expected to produce substantial written materialon the topic, to be shared and critiqued. Recommended particularly forstudents cons idering 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, the state, the nature of philosophy.

Also offered for undergraduate-level credit as Phl 414 and may be taken only once for credit. .

## Phl 515 -Aris totle (4)

Study of some of the works of Aris totle, such as his Physics, Metaphysics, Ethics, Politics, parts of the Organon Rhetoric. Among topics for attention are substance, essence, categ ories, cause, the good man, practicalreason.

Also offered for undergraduate-level credit as Phl 415 and may be taken only once for credit. .

## Phl 516 - The Rationalists: Descartes, Leibniz, Spinoza (4)

Study, with comparis ons, ofselected works of philosophers who maintained that knowledge comes primarily from reason. Likely readings: for Descartes, Meditations, orRules, or Dis course on Method; forSpinoza, Ethics; for Leibniz, a selection from among his many collected works and fragments.

Also offered for undergraduate-level credit as Phl 416 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-level credit as Phl 417 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-level credit as Phl 419 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 Investigations. Attention will be given to Wittgenstein's contributions to philosophical method, as well as to his treatment of is sues concerning language, meaning, intention, understanding, necessity, and the nature of human persons as language users.
Also offered for undergraduate-level credit as Phl 420 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 also to contemporary controversies over the feasibility of metaphysics as a rational discipline (logical positivismand its critics).

Also offered for undergraduate-level credit as Phl 423 and may be taken only once for credit. .

## Phl 524 -Epistemology (4)

Philos ophical examination of some of the main issues in the theory of knowledge (such as ourknowledge of the external world, of the minds of others, of logical and mathematical truths, etc.).

Also offered for undergraduate-level credit as Phl 424 and may be taken only once for credit. .

## 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 dualism and various forms of physicalism, behaviorism, mind-body identity theories, functionalis mand eliminativism.

Also offered for undergraduate-level credit as Phl 432 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 Phl 433 and may be taken only once for credit. .

## Phl 545 -Advanced Ethics (4)

A course in moral epistemology 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 Phl 445 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 responsibility, virtues, and the role of outcomes in moral evaluation. Course may be repeated for credit toward major requirements with departmental approval.
Also offered for undergraduate-level credit as Phl 446 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 globaljustice, multiculturalism, or power) or figure (such as John Rawls, Jürgen Habermas, or MichelFoucault) in social and political philos ophy. Course may be repeated for credit if topics are different.

Also offered for undergraduate-level credit as Phl 447 and may be taken only once for credit.

## Phl 548 -Biomedical Ethics (4)

Advanced study of central ethical is sues in medicine, biomedicalresearch, 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, and end of life care.

Also offered for undergraduatecredit as Ph 1448 and may be taken only once forcredit..

## Phl 549 - Philos ophy of Sus tainability (4)

Examination of the core philosophical issues that arise within the theory and practice of sustainability and across its three complementary dimens ions: environmental, economic, and social.

Also offered for undergraduate-levle credit as Phl 449 and may be taken only once for credit. .

## Phl 551 -Classical Figures (4)

Intens ive study of some classical figures such as Descartes, Spinoza, Leibniz, Nietzs che, Hegel. Course may be repeated for credit.

Also offered for undergraduate-level credit as Phl 451 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-modernism, or poststructuralism) or topical figure (such as Habermas, Derrida, or Benjamin) of European, "Continental" Philosophy.

Also offered for undergraduate-level credit as Phl 460 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, falsificationism, 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 Phl 470 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 is sue pertaining to scientific epistemology such as (but not limited to) explanation, causation, realism, geometry, and relativism. Topics vary per course 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 Phl 471 and may be taken only once for credit. .

## Phl 574 -Philos ophy of Logic (4)

Topics: validity, sentence-proposition, connectives, quantifiers, truth, paradoxes, logicalnecessity 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 Phl 474 and may be taken only once for credit. .

## Phl 581 -Biomedical Ethics (4)

A three-termsequence that provides a practical bioethics education in clinical health care, biomedical and behavioral research, and public policy. Phl 481/581: introduction to the concepts, methods, and literature of health care and biomedical research ethics, designed to familiarize participants with the basic definitions and arguments in the major topics of clinical and research ethics. Ph1482/582 and Phl 483/583: concepts and skills developed in 481/581 will be intensively examined; students take responsibility for several aspects of teaching. This is the first course in a sequence of three: Phl581, Phl 582, and Phl 583 which must be taken in sequence.

Also offered for undergraduate-level credit as Phl 481 and may be taken only once for credit. .

## Phl 582 -Biomedical Ethics (4)

A three-termsequence that provides a practical bioethics education in clinical health care, biomedical and behavioral research, and public policy. Phl 481/581: introduction to the concepts, methods, and literature of health care and biomedical research ethics, designed to familiarize participants with the basic definitions and arguments in the major topics of clinical and research ethics. Phl 482/582 and Phl 483/583: concepts and skills developed in 481/581 will be intensively examined; students take responsibility for several aspects of teaching. This is the second course in a sequenceofthree: Phl 581, Phl 582, and Phl 583 which must be taken in sequence.

Expected preparation: an acquaintance with health care services.

Also offered for undergraduate-level credit as Phl 482 and may be taken only once for credit. .

## Phl 583 -Biomedical Ethics (4)

A three-termsequence thatprovides a practical bioethics education in clinical health care, biomedical and behavioral research, and public policy. Phl 481/581: introduction to the concepts, methods, and literature of health care and biomedical research ethics, designed to familiarize participants with the basic definitions and arguments in the major topics of clinical and research ethics. Phl 482/582 and Phl 483/583: concepts and skills developed in 481/581 will be intensively examined; students take responsibility for several aspects of teaching. This is the third course in a sequence of three: $\mathrm{Phl} 581, \mathrm{Phl}$ 582, and Phl 583 which must be taken in sequence. Recommended prerequisite: an acquaintance with health care services.

Also offered for undergraduate-level credit as Phl 483 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.

## 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 to elementary 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 sequence of 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 oftwo: 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 coursemay be taken twice forcredit with different topics.

## Port 399-Special Studies (1-6)

(Credit to be arranged.)

## Port 404-Cooperative Education/Internship (112)

(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 legislative process; the presidency and modern bureaucracy; the Supreme Court andjudicial policymaking.

## PS 102 - United States Politics (4)

Introduction to is sues and trends in political culture, politicalbehavior, 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 coursesurveys and analyzes the major global is sues of our time, 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 thecentral themes and fundamental issues of politicallife. Examines the nature and meaning of politics and political as sociation in both domestic and international settings. Fundamental concepts and ideas associated with government, and politics more generally, are explored, along with the nature of political culture 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 nationalism, 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 War era, and the increas ing 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 political ideas of Plato, Machiavelli, Locke, Rousseau, Mill, and Marx which in troduced some of the major traditions of political thought in the west. The foundations of the communitarian, republican, and liberal political dis course 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 juris prudence, 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 res earch 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 ofmajor 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 measures. Topics include: campaign organization and management, fundrais ing and campaign finance, communications and messaging, polls and focus groups, campaign strategy and storytelling.

## PS 312 -Legislative Process (4)

An examination of the role of leg is latures in state politics. Particular attention is given to the forces that shape legislative elections, the relationship between legislatures and governors, and efforts to reform legislative 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 the relationship between the major political actors in W ashington, 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, interestgroups, and the press.

## PS 316U - Politics and the Arts (4)

Politics permeate the arts, from government support of arts org anizations to battles over public art. This course examines thegovernment's involvement in the arts. Topics include a history, modern challenges to artists and art organizations, funding, how arts policy is made, copyright protection, artists' rights, cens orship, 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 political meanings of films. Topics include: how films reflect, and sometimes challenge, basic themes in American political culture; how filmmakers capture andencode images in ways that tell a culturally-pleasing story;how audiences make senseof these images and stories to construct 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 other features of mass-mediated elections in order to enhance citizen participation. Key questions students will consider include the degree of responsibility that politicians, journalists, and citizens should assume 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 the emergence of the state. This course explores the short- and long-termorigins of current conflicts, the emergence of political movements around environmental issues, alternative world views regarding nature, and the distinctiveness of politics around these issues. 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 works hops. Includes as sistance with the law school application process such as personal statement preparation and LSAT studying. This course may be repeated for credit 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 decisionmaking processes.

## PS 325U-Politics andthe Legal Enforcement of Morals (4)

Critical examination oflaw as a mechanismforthe enforcement of moralstandards. The limits of law and political authority more generally are explored through an analysis of specific problemareas associated with the legalenforcement of morality. These include, butare not limited to: the use of criminal justice to enforce standards of conventional morality, political tolerance, civil disobedience, and the politics oflaw and order. Recommended prerequisite: PS 221.

## PS 331 - Oregon Politics (4)

An examination of political structures and policy trends in the state of Oregon. Attention is given to local governments as well as state government with special emphasis 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 interstate 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 administration since 1945. Emphas is is on U.S. relations with the U.S.S.R/Russia and the Third W orld. Recommended prerequisite: PS 205.

## PS 352 U - Introduction to European Politics (4)

An introduction to the political systems and politics of countries in both western and eastern Europe. Includes analysis of institutions, policies, and politicalbehavior, 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, stateautonomy 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 Northeastand Southeast Asia.

## PS 355U - Introduction to African Politics (4)

Introduction to the policies, institutions, and processes of the politics of Sub-Saharan Africa.

## PS 361U- 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, institutions of government, and the political systems of selected Middle East countries. Recommended prerequis ite: PS 204 or 205.

## PS 362U- Arab-Is raeli Conflict (4)

Examination of the conflicting ideological perspectives, the formation of the state of Israel, rise of Arab nationalism, emergenceof Palestinian nationalism, the Arab-Israeli 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 Israel and among the Palestinian and greater Arab communities. Recommended prerequisite: 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, terrorism, the politics of oil, and regionals security and stability in general. The coursewill focus on Iran's relations with Iraq, Syria, Is rael/Palestine, and the GulfCooperation 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 historical, 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 war crimes .

## 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 violence plays in shaping their character, duration, and outcome. Topics include genocide, famine, civil war, sexual violence in war, nationalismand 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 and Fiction (4)

This course explores various themes associated with politics as they are presented in fictional media. The course integrates traditional academic 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 is sues 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 radicalism. Issues discussed include the idea of nature in the history 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 dis cussion about an area of political science, with a research 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-SelectedTopics (1-6)

(Credit to be arranged.) Consent of instructor.

## PS 410U- SelectedTopics (1-4)

(Credit to be arranged.)

## 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.. Prerequis ite: 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, executivelegis lative 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 forcredit. .

## PS 413-Congress (4)

Study of the structure, org anization, powers and operations of Congress. Topics covered include: the evolution of Congress, congressional recruitment and elections, legislative functions, the members hip, the leaders, the committee system, the rules and procedures, executive-legislative 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 - Is sues in Public Policy (4)

A study of selected major policies and programs of governmental regulation and service. Emphas is is placed upon the formation, administration, and substantivecontentofpolicies 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 graduate-level credit as PS 514 and may be taken only once forcredit. .

## PS 415-Comparative Public Policy (4)

Introduction to theories, methods, and cases in comparative public policy. Emphasis 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 forcredit. . 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 forcredit. .

## 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 forcredit. .

## PS 418-Contemporary Political Protest in America (4)

Analyzes the role ofsocial movements in recent American history. The course blends theoretical readings with empirical research into specific movements. Movements considered include butare not limited to:civil rights, the new left, public interest reform, 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 once forcredit..

## 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 des igned to make the government work more effectively and efficiently.
Also offered for graduate-level credit as PS 519 and may be taken only once forcredit..

## 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 once forcredit..

## 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 federalism, 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 forcredit. .

## PS 423-Civil Liberties (4)

A study of Supreme Court decisions that affect individual rights and liberties. Areas of concentration include, but are not limited to, freedomofspeech 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 forcredit. .

## PS 424 -Law, Politics, andSociety (4)

Examines connection between law and the society which creates and enforces it. Law will be studied from bottomup rather than top down. Emphasis placed on what law is, how people use law, including whether access to law is equal, and how thestate 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 is sues 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 once forcredit.. Cross-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.. Prerequis ite: 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 particularattention 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 personal 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 powerby 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 disasters including both natural (earthquakes, pandemics, as teroids) and man-made (climate change, nuclear weapons, bio-terrorism) 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 international relations 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 forcredit. .

## PS 444 - National Security Strategy: Regional Perspectives (4)

Focuses on theregional 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 historical is sues that shape formation of regional security strategy, and to strategic assessments of U.S. security policies as perceived fromother regions' perspectives. Expected preparation: PS 205.
Also offered for graduate-level credit as PS 544 and may be taken only once forcredit. .

## PS 446 - National and International Security Policies (4)

A comparison of national and international security systems, strategies, and policies. Emphasis will be on the current is sues aris ing 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 forcredit. .

## PS 447 - International Organization (4)

The nature and extent of the organization of interaction among nations. Focus on the United Nations, butillustrations and generalization froma wide range of regional and functional organizations including the specialized agencies. Emphas is on the processes of communication, interaction, and negotiation with in 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 emphas is is placed on the interplay of politics and law in the international system. Types oflaw, sources of law, law creating agencies, law applying agencies
are cons idered. 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 forcredit. .

## PS 449 - International Environmental Politics and Law (4)

Explores various environmental problems and issue 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 regulateenvironmental 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 onhow 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. This is the same course as Int1452 and may be taken only once for credit.

Also offered for graduate-level credit as PS 552 and may be taken only once forcredit.. 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 forcredit. .

## PS 455 -Politics of Economic Reform in Emerging Market Countries (4)

Explores the process of economic reformin a comparative and international setting by focusing on emerging market countries (e.g., Argentina, Brazil, Mexico, Indonesia, Poland, Turkey, and Thailand). Designed to give a more in-depth analysis of reform policies for the students. Expected preparation:PS 454/554.

Also offered for graduate-level credit as PS 555 and may be taken only once forcredit. .

## 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 fromthe ashes 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 the end 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 forcredit.. Cross-Listed as: This course is the same as Intl 460 and may only be taken once for credit..

## PS 461 - 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 from the 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 is the same course as Intl 461 and may be taken only once for credit.
Also offered for graduate-level credit as PS 561 and may be taken only once forcredit.. Cross-Listed as: Intl461.

## PS 462 - International Relations of the Middle East (4)

Examination of the external dimension of Middle East politics; the role of the great powers; brief analys is 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 War era. Expected preparation: PS 361.
Also offered for graduate-level credit as PS 562 and may be taken only once forcredit. .

## 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 forcredit..

## 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 once for credit..

## 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 state of its practices. Topics include: the behavioral revolution, political development, the role of state, the new institutionalism, and the state-in-society approaches. Expected preparation: PS 204.

Also offered for graduate-level credit as PS 570 and may be taken only once forcredit. .

## 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 therepresentation of women in government, the problems confronting female candidates, the behavior of women officeholders, and the gender gap in 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 juniorstanding.
Also offered for graduate-level credit as PS 571 and may be taken only once forcredit. .

## 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: Upper-divis ion 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 forcredit. . Prerequisite: upper-division standing..

## PS 474 -Democracy and Development in Latin America (4)

Examines issues ofdemocracy and development in Latin America. It addresses such topics as the role of history, political culture, politicalleadership, political institutions, thestate, the military, civil society, social classes, levelofsocio-economic development, and their relationship to the possibilities of success or failure for democracy in Latin America. The course examines specific cas es 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 forcredit. .

## PS 475-Comparative Political Parties and Elections (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 legis lative 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.. Prerequis ite: 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 notinevitable. 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 personal experiences with inequality via exercises and as signments.

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 bothrich and poornations. Review of
competing policy arguments across issues 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.. Prerequis ite: 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: Upper-divis ion 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 ofdemocratic politics, including importantstatements in the history of political thought and contemporary political theory. Is sues discussed include participation, deliberation, electoral competition, constitutionalism, and the challenges ofdemocratic 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 practiceof liberalism as an ongoing tradition. The basic elements of liberalismare identified and discussed and criticisms of the liberal tradition, as offered by communitarians, classical republicans, feminists, and postmodernists, are examined. Liberal responses to these criticisms 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 dis tributive justice, justice and the rule of law, inter-generational justice, and political alternatives to the liberalvision of social justice. Expected preparation: PS 381.

Also offered for graduate-level credit as PS 583 and may be taken only once forcredit. .
PS 486 - 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 Jeffers onian 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 once forcredit..

## 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 properrelation 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 Darwinismand 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 graduate-level credit as PS 587 and may be taken only once forcredit..

## PS 491-Testing Theories in Political Science (4)

Survey of the most common methods used to evaluate empirical questions in political science research and assess the adequacy of theories. The course prepares students to interpret, critique, design, and conduct social scientific analysis. It examines both qualitative and quantitative methodologies, including case study, content analysis, interviewing, surveys, participant 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 permission 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 socialscience, 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 once forcredit..

## PS 495-Topics in SpecializedResearch Methods for Political Science (4)

An examination of a specialized methodological approach and/or technique for interpreting and conducting empirical politicalscience research. Each quarter will offer in-depth coverage of a single topic; topics will vary from quarter to quarter dependent on student interests and instructor specialty. Sample topics include: network analysis, survey research, qualitative methods, formal modeling, maximum likelihood estimation, orus age of specific statistical software applications. Expected preparation: Mth 243 , Mth 244, and/or PS 491. This course may be repeated forcredit with different topics.
Also offered for graduate-level credit as PS 595. Prerequisite: Upper-divisionstanding.

## PS 501 - Res earch (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 project required. 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, pres idential powers, relations with media, presidential leadership. White House staff, executivelegis lative relations, and the presidential role in domestic, economic, foreign policy making and execution.

Also offered for undergraduate-level credit as PS 412 and may be taken only once for credit. .

## PS 513-Congress (4)

Study of the structure, org anization, powers and operations of Congress. Topics covered include: the evolution ofCongress, congressional recruitment and elections, legis lative functions, the membership, the leaders, the committee system, the rules and procedures, executive-legis lative relations, pressure groups, lobbying, and reform.
Also offered for undergraduate-level credit 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, administration, and substantivecontentofpolicies in such areas as trans portation, public utility regulation, medical care, civil rights, education, agriculture, natural resources, and antitrust laws and the preservation of competition.

Also offered for undergraduate-level credit as PS 414 and may be taken only once for credit..

## PS 515-Comparative Public Policy (4)

Introductionto theories, methods, and cases in comparative public policy. Emphasis on policy learning and applied comparative policy analysis . Unique and shared characteristics of policies in different countries orregions. Topics may include welfare and environmental policy.
Also offered for undergraduate-level credit 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 electoralreform.

Also offered for undergraduate-level credit 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-level credit 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 butare not limited to:civil rights, the new left, public interest reform, 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 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 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 constitutional interpretation, and the way political forces and influences shape Court practices, judicial selection, and the decis ion-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 decisions that affect individualrights and liberties. Areas of concentration include, but are not limited to, freedomof speech and press, religious liberty, criminal justice, racial justice, gender justice, and the rightto privacy.

Also offered for undergraduate-level credit 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 and enforces it. Law will be studied from bottomup rather than top down. Emphas is placed on what law is, how people uselaw, including whether access to law is equal, and how thestate 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 legal 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-level credit as PS 426 and may be taken only once for credit.

## PS 527 - 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 measure public opinion and problems with those methods; and the content of Americans' views on controversial political is sues.
Also offered for undergraduate-level credit 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 increasingly punitive, the criminal justice systemhas expanded in size and scope, crime control has become increasingly federalized, and record numbers of Americans 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 popularbeliefs about criminals and the causes of crime interact with the media and the political system to 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 over time 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 internationalrelations. Themes include the grand theoretical traditions of liberalis $m$, realism, and radicalism; analytical and methodological perspectives, 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 importanceof 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 comparison.

Also offered for undergraduate-level credit as PS 431 and may be taken only once for credit. .

## PS 535 - Dis asters 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, bio-terrorism) 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 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 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 -Res olving International Conflicts (4)

A seminar that explores different kinds of international dis putes and actual conflicts in order to
identify and assess theories, analytical frameworks, and methods of conflict resolution, management, and prevention. Emphas is 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 historical is sues that shape formation of regional security strategy, and to strategic assessments of U.S. security policies as perceived fromother 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 issues and problems.

## PS 546 -National and International Security Policies (4)

A comparison of national and international security systems, strategies, and policies. Emphasis will be on the current is sues aris ing 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 organizations including the specialized agencies. Emphas is 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 oflaw, sources of law, law creating agencies, law applying agencies are cons idered. Contemporary substantive is sues in internationallaw 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 and Law (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 internationallegal 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 beginnings in the 1950s, on its present-day organization and functions, and onhow 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 restof 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, and Future (4)

Uses power transition 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 the next series of upheavals will occur in the international system.

Also offered for undergraduate-level credit as PS 453 and may be taken only once for credit. .

## PS 554 - 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.

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 internationalsetting by focusing on emerging market countries (e.g., Argentina, Brazil, Mexico, Indonesia, Poland, Turkey, and Thailand). Designed to give a more in-depth analysis of reform policies for the students. Expected preparation:PS 554.

Also offered for undergraduate-level credit 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 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.

## PS 559-Political and Economic Decision-making (3)

Examines the philos ophical and conceptual as sumptions embodied in alternative decis ion-making theories in the fields of economics and politics. Des igned to show students the differences in individual and collective decision-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 course is the same as USP 636; can only be taken once for credit. Recommended prerequisite: USP 515/615.

Cross-Listed as: USP 636.

## PS 560 - 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 ashes of the Ottoman Empire and evaluate stages of political development during the first, second, and third republic. Finally, assesses the implications ofTurkey's new geopolitics (since the end of theCold 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 from the 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 the same as Intl 561 and may be taken only once forcredit.
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 analys is 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 War era.

Also offered for undergraduate-level credit as PS 462 and may be taken only once for credit. .

## PS 563 - Politics and Policy 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 Israeli-Palestinian conflict, and regional and international relations of the greater Middle East.

## 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 ofregional and extra-regional relationships.

Also offered for undergraduate-level credit 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-in-society 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 gap in 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-level credit 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, political economy, 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 for credit. .

## PS 574 - Democracy and Development in Latin America (4)

Examines issues ofdemocracy and development in Latin America. It addresses such topics as the role of history, politicalculture, politicalleadership, political institutions, thestate, the military, civil society, social classes, levelof 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 and Elections (4)

Parties and elections are crucialelements 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 legis lative 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 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 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 personal experiences with inequality via exercises and as signments.
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 poornations. Review of competing policy arguments across issues relating to food security, markets and market access, and the environment and public health.

Also offered for undergraduate-level credit as PS 477 and may be taken only once for credit.. Prerequisite: Upper-division 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-level credit 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 froman 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-level credit as PS 479 and may be taken only once for credit. .

## PS 581 -Democratic Theory (4)

Critical examination ofthe principles ofdemocratic politics, including importantstatements in the history of political thought and contemporary political theory. Issues discussed include participation, deliberation, electoral competition, constitutionalism, and the challenges ofdemocratic legitimacy in the context of US institutions and increasing globalization.
Also offered for undergraduate-level credit as PS 481 and may be taken only once for credit. .

## PS 582 -Liberalism and Its Critics (4)

Critical examination ofthe theory and practice of liberalis $m$ as an ongoing tradition. The basic elements of liberalismare identified and discussed and criticisms of the liberal tradition, as offered by communitarians, classical republicans, feminists, and postmodernists, are examined. Liberal responses to these criticisms are also explored.
Also offered for undergraduate-level credit 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 586-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 cons idered include the English background; the colonial mind; ideas informing the revolution; the creation of the Constitution; and the ratification debates; the Jeffers onian 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 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 include democratization and the Jacksonian period, slavery, and the nature of the Union, Social Darwinismand indus trialization, 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 all future political scientis ts working in academia will need: first, the skills necessary to create a top-quality application package that will get students into topranked PoliticalScience PhD programs, and second, the skills to revise written work into an excellent writing sample or conferencepaper.

## PS 589-How to Teach and Present Social Science Research (2)

Focuses on theskills necessary for designing and teaching a political science course and delivering effective research presentations at conferences. Students will spend the first half of the course on teaching skills and the second half on building and workshopping presentations, emphasizing skills such
as public speaking, buildingeffectives lideshows 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 essential skills for success in graduate level education, such as: how to read academic literature, note-taking and seminar norms, 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 themthroughout their career.

## PS 591 - Testing Theories in Political Science (4)

Survey of the most common methods used to evaluate empiricalquestions in political science research and assess the adequacy of theories. The course prepares students to interpret, critique, design, and conduct social scientific analysis. It examines both qualitative and quantitative methodologies, including case study, contentanalysis, interviewing, surveys, participant observation, field experiments, and statistical analysis. PS 591 is required for graduate students in the political science master's programand 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, 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 undergraduate-level credit as PS 493 and may be taken only once for credit..

## PS 594 - Res earch Design for Politics and Policy

(4)

This course will introduce the logic ofsocial 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/ortechnique 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 studentinterests 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 forcredit with different topics.

Also offered for undergraduate-level credit as PS 495.

## 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 Israeli-Palestinian conflict, and regional and international relations of the greater Middle East.

## Psy - Psychology

## Psy 200 - Ps ychology 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 psychological dis orders. Describes theories and research findings in the context of social is sues and introduces students to challenges of psychological measurement. Recommended as a first psychology course forboth majors and nonmajors.

Psy 207 - Introduction to Applied Psychology (4)
A survey ofs elected applications of concepts and methodolog ies fromthe different areas of psychology such as experimental, industrial/organizational, social, and developmental. Recommended prerequisites: Psy 200, 204.

## Psy 299 -Special Studies (1-4)

(Credit to be Arranged.)
Prerequisite:Psy204..
Psy300U-Pers onal Decision Making (4)
How to make wiser decisions. Ways to think more creatively and more logically in making both everyday choices and major life decisions. Ins truction and hands-on experience.

## Psy 310U- Psychology of Women (4)

Review and evaluate as sumptions underlying psychological research on women. Survey the research in areas such as the development ofsex differences, acquisition of gender roles and maintenance of gender stereotypes. Explore the pertinenceof these findings to topical areas such as women's work roles, women and mental health, and the women's movement. Recommended prerequisite: 4 credits in psychology.

## Psy311U-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 Psychology (4)

The coursecombines career considerations with exploration ofmultiple aspects of psychology as a discipline and their relevance to student futures. Exposure to faculty, graduatestudents and employers will help ground decisions aboutemployment and graduate school, broadening perspectiveon what it is to be a knowledgeable, 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, comparisons of means among groups, relations among variables, statistical model specification with multiple predictors, and the analys is 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 meas urements, 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 invalidity. Recommended prerequisites: Stat 243,244 , and 4 credits in psychology.

## Psy 340 - Principles of Behavior Analysis (4)

A course in the concepts ofbehavior analysis. Includes presentation of respondent and operant conditioning, extinction, response differentiation, schedules of reinforcement, shaping, escape and avoidance behavior, stimulus discrimination, punishment and similar concepts. The course is intended to provide the student 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 associated with people's thoughts about and interactions with one another. Particular emphases on self, social identity, social cognition, attitudes, prejudiceand 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 associated with interpersonal, group, and inter-group behavior. Particularemphases 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 forboth 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)

Processes by which we formrepresentations 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 200-level psychology.

## 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 bas ic 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- levelpsychology.

## 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 all types. 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 measurement of individual differences forhiring and promoting workers, the assessment of employee performance through performance appraisal systems, and employee training. Course contains a substantial component focused on application through a community-based learning or clas s 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 issues, stress, job attitudes, and occupational health psychology. Course contains a substantial component focused on applications such as community based learning or class 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 404 -Cooperative Education/Internship (0-12)
(Credit to be arranged.)

## Psy 405 -Reading and Conference (1-6)

(Credit to be arranged.) Consent of ins tructor.

## 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 -Ecopsychology (4)

Course explores a range of topics regarding the human-nature relationship, including humans as an ins eparable fromnature, 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 psychologicalunderpinnings of the Black male experience in American culture; looks at the "invisibility syndrome" and the impact of discrimination 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 - Psychology of Stigma \& Social Inequality (4)

Investigates the ways in which individuals perceive, respond to, perpetuate, and work to dis mantle stigma and social inequality. 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 about how to apply our knowledge to currentsocial issues and policy.
Prerequisite:Upper-divisionstanding..
Psy 427 -History and Systems of Ps ychology (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 forcredit. .

Psy 428 -Diversity, Prejudice and Intergroup Relations (4)
Delves into social psychological research and theory on Prejudice, Diversity, and Intergroup Relations. From a social psychological perspective, it addresses both historical and contemporary perspectives on stereotyping, prejudice, and dis crimination, including implicit bias, modern racism, social identity threats, and benevolentsexism. 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 counteractbias.

Prerequisite:Upper-division standing..
Psy 429 - The Psychology of Race \& Gender in
Sport (4) Sport (4)

Using a social psychological approach, th is 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 discrimination impact athletes, coaches, referees, and fans.
Prerequisite:upper-division standing..

## Psy 430 -Applied Social Ps ychology (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, politicalattitudes, 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- Ps ychology 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 issues in men's lives, including emotions, health, work and family roles, sexuality, relationships, and violence.

Prerequisite: four credits in psychology..

## Psy 432 -Personality (4)

Personality structure and theory. Recommended prerequisite: Stat 243 and 244, eight credits in psychology, including Psy 321.

## Psy 433 - Introduction to Psychological Testing (4)

Covers theoretical and practical issues 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 testand 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 mentalillness, the origins of mental illnesses, 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.
Expected preparation: Psy 200, Psy 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 forcredit. .

## Psy 436-Performance Appraisal and Feedback (4)

Applications of psychological concepts to the development of performance apprais al systems in organizations. Topics include job analysis, cognitive processes in performance appraisal, types of rating scales, rater training methods, technical as pects of developing a performance apprais al system, performance feedback, 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 440 -Group Process (4)

A course on the psychology ofsmall groups. Topics will include but not be limited to: interpersonal attraction, stages of group development, group structure, coalition formation, personal power, leadership, group decis ion making and problem solving, intergroup relations and the principles of negotiation. Expected preparation: Stat 243 and Stat 244, Psy 321, graduatestanding or consent of instructor.

Also offered for graduate-level credit as Psy 540 and may be taken only once forcredit. .

## Psy 444 -Job Analysis (4)

Methods (e.g., interviews, surveys) used to collect information about jobs for use in human resource functions such as personnel recruitment and selection, training, performance appraisal, and compensation. Such information is also used to develop job 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 Administration courses.

Also offered for graduate-level credit as Psy 544 and may be taken only once forcredit. .

## Psy 445 -Employee Development (4)

Covers the application of psychological principles to employee training and development. Topics include organization, job, and person analysis; program design; 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. 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 forcredit. .

## Psy 447 - Personnel Psychology (4)

How individual differences affect work behavior and taskperformance and how psychologists measure and predict such differences. Covers the development, administration, and utility of modern instruments for selection and appraisal. Data combination strategies and decision making in pers onnel systems are discussed. 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 - Ps ychology of Work Motivation (4)

Examination of the role that motivation plays in initiating, guiding, and maintaining work behaviors. Discussion ofjob attitudes, emotional intelligence, personality factors, socialization and culture, effects of participation, careers, job enrichment, reengineering, and power and politics. Expected preparation: Psy 321.
Also offered for graduate-level credit as Psy 548 and may be taken only once forcredit. .

## Psy 449 -Survey of Human Factors (4)

An introduction to systems analysis concepts. An examination of the role of man and his interrelationships with complexman-machine systems. Topics include: man-machine systems, visual and auditory presentation of information, design of controls, layout of work places, effects of environmenton human performance, and the physical limits of human performance. Recommended prerequisites: eight credits in psychology; Stat 243, 244, and Psy 321.

## Psy 450 - Ps ychopharmacology (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 divis ion 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 asPsy 551 and may be taken only once forcredit.. 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 experimental design, evaluation of research methods, formulation and testing of hypotheses using research procedures, use of statistical software for analyzing theres earch data, writing a research manuscriptusing APA form. Recommended prerequisites: at least 12 credits in psychology includingPsy 321 and at least one of the following: Stat 243 and 244.

## Psy 455-Experimental Psychology (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 manuscriptusing 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 458 -Development \& Education of AfricanDiaspora Children \& Youth (4)

Explores development from childhood through emerging adulthood forpersons in the Africandiasporausing a sociocultural psychology perspective. Individual African-American 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-divisionstanding..

## Psy 459 -Infant Development (4)

Development of the individual from conception to age two. Theory and research pertaining to infant development.

## Psy 459U- Infant Development (4)

Development of the individual from conception to age two. Theory and research pertaining to infant development.
Prerequisite:Upper-divisionstanding.

## 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 461U- Psychology of Adolescence and Early

 Maturity (4)Development of the individual frompuberty to early adulthood. Theory and research pertaining to adoles cent development.
Prerequisite:Upper-divisionstanding..

## 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 froma life-span pers pective. Expected preparation: Stat 243 and Stat 244, Psy 311 and Psy 321 plus one ofthe following: Psy 459, Psy 460 , or Psy 461.
Also offered for graduate-level credit as Psy 562 and may be taken only once forcredit. .

## 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 coursereadings 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-divisionstanding..

## Psy 464 -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. 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 res earch in selected areas of applied developmental psychology. Expected preparation: Stat 243 and Stat 244, Psy 311 and Psy 321 and consentof 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 forcredit. .

## Psy 468 -Social Development (4)

Development of individual's social relationships from infancy to adolescence. Theory and res earch 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 emphasis on the psychological as pects 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 decis ions we make aboutsex. This course is designed to increase awareness and sensitivity to sexuality and issues 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 aspects of diversity and management. We will first cover the psychology of diversity and inclusion and proceed to cover the perspectives of several different employee groups. We will also discover relevant theoretical and
practical considerations concerning strategies for implementing effect diversity management policies and procedures.
Prerequisite: 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 pers ons 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 and PHE 223 may be substituted for 4 of thesecredits.
Also offered for graduate-level credit as Psy 571 and may be taken only once forcredit. .

## Psy 478 -Leadership and Group Effectiveness (4)

Study of leadership in small 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 ofleadership 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 forcredit. .

## Psy 479 -Women and Organizational Psychology (4)

Examines the relationship between gender and work in different kinds oforganizations 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 mass media. In this course, students will learn major theories and concepts in the field, apply them to pressing 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 once forcredit. . Prerequisite: upper-division standing..

## Psy 484 -Principles of Behavior Modification (4)

A survey ofrecent 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 psychology, social work, specialeducation, speech pathology, and nursing. Expected preparation: Psy 346.

Also offered for graduate-level credit as Psy 584 and may be taken only once for credit. . 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 issue4s, specific techniques of change and the application of these techniques within a systematic program development model. Expected preparation: Psy 346.

Also offered for graduate-level credit as Psy 585 and may be taken only once forcredit. . 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 includes ignal detection theory, information theory, reaction time, attention, effort. Measures and theories of mentalworkload will be discussed as well as what leads to cognitiveoverload 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 andmethodology for the study of processes and change in life-span developmental perspective. 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, des criptive models, and cognitive aids forstructuring 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 ins tructor..

## 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 ofjudgment 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 forcredit. .

## Psy 495 - Ps ychological Meas urement (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 analys is, 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 forcredit. .

Psy 498 -Field Obs ervation Methods (4)
Applied experience in the major methodological techniques of field observation, as well as the key problems of validity and reliability as they arise while developing a behavioral observation system. Expected preparation: Stat 243 and Stat 244, Psy 321, plus 12 upper-division credits in psychology.

Also offered for graduate-level credit as Psy 598 and may be taken only once for credit. .

Psy 501 - Res earch (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 evaluative reports.

Psy 510 -Selected Topics (1-6)
(Credit to be arranged.)

## Psy 513 -Ecopsychology (4)

Course explores a range of topics regarding the human-nature relationship, including humans as an inseparable fromnature, 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 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 social psychology.

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 includingjob analysis, performance appraisal, personnel selection, legal is sues, and training. Expected preparation: admis sion to Psychology 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 ofdes igning an experimental investigation of psychological phenomena in a naturalistic field setting. Course requirements include the design of a realistic research proposal. Extensive use is made of instructor experience with field experimental studies in the field of mentalhealth.

Prerequisite: graduatestatus 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 as sessment 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 designs, 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, multivariate analys is of variance, analysis of covariance, and logistic regression. SPSS will be used for conducting analyses and students will gain experience in writing journal quality results and dis cussion 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 analys is, 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 623 and may be taken only once for credit..

## Psy 524 -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 issues 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 psychological theory 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 chisquare, contingency table analyses, matched pairs analyses, loglinear models, log istic and probit regres sion models, propensity scores, ordinal and multinomial logistic regres sion, generalized linear models, and categorical meas urement is sues.

Also offered as Psy 625.. Prerequisite: Students should haveat leastone graduate statistics course covering chi-square, ANOVA, and regression analys is, such as Psy 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: random coefficients, 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 knowledge about multiple regres sion analysis.
Prerequisite: Prerequisites: Psy 521/Psy 621 and Psy 522/Psy 622 or equivalent approved by instructor..

## Psy 527 - History and Systems of Ps ychology (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.
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 - Ps ychological Is sues 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 is sues and psychological predictors ofsuccessfulaging. Emphasis 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 Ps ychology (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-level credit 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 knowledgeofsocial psychology 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 mental illnesses, the diagnostic systemand 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.

Also offered for undergraduate-level credit as Psy 434 and may be taken only once for credit. .

## Psy 535 -Psychological Cons ulting in Organizations (4)

Psychologically-based theories and techniques aimed at the planned change oforganizational work setting for the purpose of enhancing individual development and improving organizational performance. Issues in consultant-client relationships, specific change methods, and systemramifications of guided change us ing 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 apprais al systems in organizations. Topics include job analysis, cognitive processes in performance appraisal, types of rating scales, rater training methods, technical as pects of developing a performance apprais al system, performance feedback, 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 Res earch Methods for Social Inquiry (4)

Introduction to qualitative research methods in psychology. Covers ep is temology, research design, data collection techniques, narrative analysis, computer-aided analysis oftext, qualitativeresearch 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 ofsmall groups. Topics will include but not be limited to: interpersonal attraction, stages of group development, group structure, coalition formation, personal power, leadership, group decision making and problem solving, intergroup relations and the principles of negotiation. Expected preparation: graduate standing or consent of instructor.

Also offered for undergraduate-level credit as Psy 440 and may be taken only once for credit. .

## Psy 544 -Job Analysis (4)

Methods (e.g., interviews, surveys) used to collect information about jobs for use in human resource functions such as personnel recruitment and selection, training, performance appraisal, and compensation. Such information is also used to develop job 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; program
design; the application oflearning 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-level credit 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 - Personnel Psychology (4)

How individual differences affect work behavior and task performance and how psychologists measure and predict such differences. Covers the development, administration, and utility of modern instruments for selection and appraisal. Data combination strategies and decision making in pers onnel systems are discussed.

Also offered for undergraduate-level credit as Psy 447 and may be taken only once for credit.

## Psy 548-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, reengineering, 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 practicedrawn from psychology andother disciplines in the promotion and development of workplace health- and safetyrelated initiatives. OccupationalHealth 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 well being 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 for studying 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 manuscriptusing APA form.
Also offered as Psy 654 and may be taken only once for credit. .

## Psy 559 - Infant Development (4)

Developmentof the individual from conception to age two. Theory and research pertaining to infant development.

## Psy 560 - Child Psychology (4)

Developmentof the individual from conception through childhood. Theory and research pertaining to child development.

Also offered for undergraduate-level credit as Psy 460 and may be taken only once for credit. .
Psy 561 -Ps ychology of Adolescence and Early Maturity (4)

Development of the individual frompuberty to early adulthood. Theory and research pertaining to adoles cent 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-level credit 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 ofdevelopmental principles to an
understanding of social, emotional, and conduct dis orders 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-level credit 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, selfsystem processes, and the social and cross-cultural contexts of development, including the family, schools, and day care. Involves datagathering, analys is, and/or reporting results of research conducted in a field setting. Emphasis on applied is sues related to research design, data collection, data analys is, 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 res earch 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. Res earch areas may include social relationships and health behaviors; social relationships and subjective well-being; communitybased interventions; self-help groups; social psychological 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 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 pers ons respond 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 small 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 ofleadership 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 relationship 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 them to 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 adjus tment. 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.

Also offered for undergraduate-level credit as Psy 484 and may be taken only once for credit. .
Psy 585 -Self-modification of Behavior (4)
The technology ofself-change developed within the framework of behavior modification theory,
including relevant ethical and theoretical issue4s, specific techniques of change and the application of these techniques within a systematic program development model.
Also offered for undergraduate-level credit as Psy 485 and may be taken only once for credit.

## Psy 586 -Social Program Evaluation (4)

Foundational concepts in social programevaluation theory and practice including theoretical perspectives on the nature and purpose of programevaluation, phases of programevaluation, ethics and standards of practice, sociopolitical considerations, 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 ofdifferent 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 transmis sion of social norms (cultural, organizational, and interpersonal).

Also offered as Psy 689 and may be taken only once for credit.. Prerequis ite: graduate status.

## Psy 591 -Decision Making I: Values and Choice (4)

Normative models, des criptive models, and cognitive aids fors tructuring 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 592 -Decision Making II: Judgement and Reas on (4)

Normative and descriptive models forstructuring decision problems, evaluating consequences of alternative courses 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 ofjudgment 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 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 decision analysis, psychophysics, and descriptive and theoretical applications of Markov chains in the study of learning and interpersonal interactions.

## Psy 595-Psychological Meas urement (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 analysis, 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 analys is, and report writing.

Also offered for undergraduate-level credit as Psy 497 and may be taken only once for credit. .

## Psy 598 -Field Observation Methods (4)

Applied experience in the major methodological techniques of field observation, as well as the key problems of validity and reliability as they arise while developing a behavioral observation 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 -Dis sertation (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 614 -Advanced Applied Social Psychology (4)

Theory, methods, and selected topics in advanced applied social psychology.

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 developmentalpsychology.
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 Ps ychology (4)

Theory, methods, and selected topics in industrial psychology including job analysis, performance appraisal, personnel selection, legal is sues, 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 specialattention to the use of human subjects in psychological research. Addresses ethicalissues 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 dis plays, descriptive statistics, statistical inference, group comparisons, analysis of variance forbetween 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 statisticalmethods with several variables, including: simultaneous and hierarchical regression, discriminant analysis, multivariate analys is of variance, analysis 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 analys is, 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 bas ic design issues 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 psychological theory and res earch.
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 chisquare, contingency table analyses, matched pairs analyses, loglinear models, logistic and probit regres sion models, propensity scores, ordinal and multinomial logistic regression, generalized linear models, and categorical measurement is sues.

Also offered as Psy 525.. Prerequisite: Students should haveat leastone graduate statistics course covering chi-square, ANOVA, and regression analys is, 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 illustrations using computer software. Topics include: random coefficients, 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 knowledge about multiple regression analysis.
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 Iss ues in Later Life (4)

Methodological, theoretical and empirical issues in research on psychology and aging. Topics include cognitive processes, family and caregiving relationships, environmental is sues and psychological predictors ofsuccessfulaging. Emphasis is on encouraging students to develop their own research project in the field of psychology of aging.

Prerequisite: 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 Ps ychology (4)

Current knowledgeofsocial psychology 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 attitudeand 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 -Ps ychological Cons ulting in Organizations (4)

Psychologically-based theories and techniques aimed at the planned change of organizational work setting for the purpose of enhancing individual development and improving organizational performance. Is sues 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 Res earch Methods for Social Inquiry (4)

Introduction to qualitative research methods in the social sciences. The coursereviews epistemologies informing qualitative research. Thecourse also
explores commonly used methods including field notes, interviews, focus groups, case studies, observational methods, and open-ended 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 measurement (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 from psychology and other disciplines in the promotion and development of workplace health- and safetyrelated 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 well being of individuals in occupational settings.
Also offered as Psy 550 and may be taken only once for credit..

## Psy 654 -Social Ps ychology 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 manuscriptusing 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, selfsystemprocesses, and the social and cross-cultural contexts of development, including the family,
schools, and day care. Involves datagathering, analys is, and/or reporting results of research conducted in a field setting. Emphasis on applied is sues related to res earch design, data collection, data analys is, 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 res earch mentor. Research areas may include social relationships and health behaviors; social relationships and subjective well-being; communitybased interventions; self-help groups; social psychological perspectives on social movements; gender is sues; 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 569 and may be taken only once for credit..

## Psy 686 -Social Program Evaluation (4)

Foundational concepts in social programevaluation theory and practice including theoretical perspectives on the nature and purpose of 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 transmis sion of social norms (cultural, organizational, and interpersonal).
Also offered as Psy 589 and maybe taken only once for credit.. Prerequis ite: graduate status. .

## Psy 695-Psychological Meas urement (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 analysis, standardization, and applications of measures via both lectures and hands-on experiences in the lab. Expected preparation: Psy 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, administrators, and the school community to fulfill various roles of the reading specialist. Among the roles to be demonstrated during the practicum are: (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 literacy-focused professional development sessions for faculty, administrators, instructional as sistances, and parents.

Prerequisite: The practicummay not be taken untila candidate has completed a minimum of 12 credit hours of cours ework in literacy. Typically, the practicum is the final capstone course of the reading endorsement course of study..

## READ 518 -Language and Literacy Development, K-8 (3)

Examine the connection between early childhood oral languageacquisition 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, grammaticalknowledge, 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 as sessment tools through culturally responsive and culturally sustaining pedagogical lenses. Includes characteristics associated 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 curriculum and 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 Class rooms K-12 (3)

This course focuses on the exploration of literature for students in grades K-12, and the application of literature in the classroom. Emphasis is on selection and evaluation ofbooks, children's reading interests, classroomapplications and school leadership in promoting literature in classroomand 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 Adoles cent 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 theirown clas sroom. Recommended prerequis ites: 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 classrooms. The course provides a comprehensive approach to the development of a writing classroom, 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 relateto boys' learning style. Demonstrate appropriate profes sional knowledge, skills and dispositions 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 Ass essment (3)

Examines purposes for and types of literacy assessment; how culture and language intersect with as sessment. Addresses selection of specific assessments to guide ins truction, using assessments to inform various stakeholders, evaluation of validity and reliability, assessment bias, stereotype threat, advocating for equity and asset-based practices with colleagues, schoolwide assessment plans, and analys is of current practices. Field-based 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 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 useofmedia 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 as sessing reading comprehension and vocabulary. Emphasis 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. Fieldbased work with K-12 reader experiencing difficulty with comprehension or vocabulary.

## READ 551 - Literacy Ins truction 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 researchbased, and proven effective to promote literacy development. Topics include (butare not limited to):
(1) language and literacy development; (2) characteristics of specialneeds students; (3) framework of effective literacy instruction within context of students with special needs; (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). Psychometrics (the science of measurement in the socialsciences). 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 as sessmentand students with special needs (English language learners, students with learning disabilities, talented and gifted students). Testethics and how as sessment results are used (including communication with various stakeholders). Recommended prerequisites: enrollment in ReadOregon ReadingEndorsement programor 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. Emphasis is on thefunctional planning, organization, and management of classroomand school-wide reading programs. Recommended prerequisites: Enrollment in ReadOregon ReadingEndorsement programorCOE Literacy or master's program.

## READ 582 - Reading Leadership in Middle and High Schools (3)

Designed for adminis trators and teachers in leadershiproles 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 analys is of real estate finance and investments. Emphasis on the developmentof problemsolving capabilities through the useof computer application programs. Specialattention is given torisk analysis, alternative mortgage instruments, hedging techniques, and thetaxeffects of realestate 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 landuse, environmentalquality, trans portation, 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 for credit.
Prerequisite: Ec 201, Ec 202 and juniorstanding.. Cross-Listed as: Ec 431 and USP 431.

## RE 438 - Real Estate Law I (3)

Provides students with a comprehensive summary of real property from a legal pers pective with an emphas is on transactional issues. Includes is sues relating to types of ownership, descriptions of property, eas ements, public and private limitations on use, real estate contracts, forms utilized in trans fers, financing and title assurances. The class will enable students to understand the legal framework and the rights and responsibilities ofowners and trans ferors/transferees of real property. This is the same course as USP 438 and may be taken only once for credit.

Also offered for graduate-levelcredit as RE 538S 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 es tate appraisal and valuation. Topics include valuation for financial reporting, determining the highest and best use 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 forcredit. . Prerequisite: RE 439 and Fin 319.

## RE 460 - Real Estate Finance II (4)

Finance principles applied in the context of real estate investments. Financials trength analysis, cash flow estimation, determining the cost of capital, various discounted cash flow methods. Option valuation and realoptions approaches. Relative valuation approaches. Applied to the valuation of Real Es tate Investment Trusts and other real estate development entities.

## RE 501 - Res earch (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 business financewithin the context of commercial real estate. Concepts and techniques will include financial statements, analysis, and forecasting; present value and discounted cash flow analys is, an introduction to real estate valuation measurements; and analysis of performance risk versus return. Students also receive an overview of the legal definitions of real estate terminology, including title, contract, regulation, and financing
is sues, and case studies in reales tate development. Expected preparation: Ec 201 and Ec 202.

## RE 522 - Real Estate Finance II (4)

Application of finance and economic principles to analys is of real estate financeand investments. Emphasis on the development of problemsolving capabilities through the useofcomputer application programs. Special attention given to risk analysis, alternative mortgage instruments, hedging techniques, and the taxeffects of real estate investment.

Prerequisite: RE 521..

## RE 523 - Real Estate Investment Analytics (4)

Students will learn financial approach to analyzing real estate investments, analyzing case studies of investment decisions, learning spreadsheet-based software for analyzing leases and income flows, and understanding the taximplications of real estate investment.

Prerequisite: RE 521 and RE 522 or permission of the instructor. RE 522 may be taken concurrently..

## RE 531 - Executive Perspectives on Real Estate (1)

A series of presentations by local and regional leaders in the realestate industry highlighting is sues in the development of their business and career opportunities in the real estate 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 the human res ources 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 formultifamily properties.
Also offered for undergraduate-level credit as Mgmt 432 and may be taken only once for credit.. CrossListed as: This is the same course as RE 532S and may be taken only once for credit..

## RE 532S -Multifamily Property Management (4)

Gives students an overview ofmultifamily property management, including operations, maintenance, management and leasing of various types of apartment communities. The course will cover
fundamental components of the human res ources 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-level credit as Mgmt 432 and may be taken only once for credit.. CrossListed as: This is the same course as RE532 and may be taken only once for credit..

## RE 533 - Commercial Property and Asset Management (4)

Explores management of differentclasses of commercial real estate including office, retail, and industrial as well as management of a portfolio of real es tateas sets. Students will gain an understanding of the following areas of commercial property and assetmanagement: financial/budgeting, facility, management, and legal. Discussions will cover leas ing 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.. CrossListed as: This is the same course as RE533S and may be taken only once for credit..

## RE 533S - Commercial Property and Asset Management (4)

Explores management of differentclasses of commercial real estate including office, retail, and industrial as well as management of a portfolio of real es tate as sets. Students will gain an understanding of the following areas of commercial property and assetmanagement: financial/budgeting, facility, management, and legal. Discussions will cover leas ing 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.. CrossListed as: This is the same course as RE533 and may be taken only once for credit..

## RE 538S - Real Estate Law I (3)

Provides students with a comprehensive summary of real property froma legal perspective with an emphasis on transactional 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 assurances. Theclass 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 538 and may be taken only once for credit. Expected preparation for graduate students: RE 521.

Also offered for undergraduate-level credit 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 assets. Analysis of income and expenses, net operating income, leveraged and unleveraged cash flows, debt coverage ratios, direct capitalization, multipliers, and discounted cash flows. Marketability analys is, highest and best use concepts, zoning, environmentalissues, and the risks and rewards of real estatedevelopment are discussed.
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. CrossListed as: This is the same course as RE 539S and may be taken only once forcredit..

## 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. CrossListed as: This is the same course as RE 539 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 from 439/539 to examine case studies in realestate appraisal and valuation. Topics include valuation for financial reporting, determining the highest and best use 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 teamand 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 willdemons 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 reales tate and housing, including land rent, interest rates, apartment rents, and housing prices, using an economic framework. Basic concepts in urbaneconomics 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 mostcommonly used in real estate and housing economics: hedonic pricing. Explores the rationale and impact of government intervention in the private realestate market. Expected preparation: USP 515 or Fin 512.

Corequisite: Taking RE 521 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 to elementary 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 ofthree: 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 ofthree: 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, and elementary readings. This is the third course in a sequence ofthree: 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 sequence of three: Rus 111, Rus 112, and Rus 113.

Prerequisite: admis sion to the Russian Flagship 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 Russian Flagship Program. This is the second course in a sequence of three: Rus 111, Rus 112, and Rus 113.

Prerequisite: admission to the RussianFlagship Partner Program.

Rus 113 -Introduction to FlagshipStudies Term3 (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 third course in a sequence of three: Rus 111, Rus 112, and Rus 113.

Prerequisite: admission to the Russian Flagship Partner Program.

## Rus 150 - Beginning Flagship Russian Term 1 (6)

Intensive introductionto fundamentals of Russian focusing on language production in high-frequency settings. Conducted primarily in Russian, the course prepares students forstudy in Russia and is a prerequis ite for furtherstudy in the Russian Flagship Program. This is the first course in a sequence of three: Rus 150, Rus 151, and Rus 152.

## Rus 151 - Beginning Fagship Russian Term 2 (6)

Intensive introductionto fundamentals of Russian focusing on language production in high-frequency settings. Conducted primarily in Russian, the course prepares students forstudy in Russia and is a prerequisite for furtherstudy 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 Flags hip Russian Term3 (6)

Intensive introduction to fundamentals of Russian focusing on language production in high-frequency settings. Conducted primarily in Russian, the course prepares students forstudy in Russia and is a prerequisite for further study in the Russian Flagship Program. This is the third course in a sequenceof 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 201 H - Second-year Russian Heritage ()

Designed for students who speak Russian buthave limited writing skills. Covers the contentofsecondyear Russ ian with particular attention to writing. Rus 203 H satis fies the PSU BA requirement and prepares students to enter Rus 301 H .

## 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 forstudents who speak Russian buthave limited writing skills. Covers the contentofsecondyear Russian with particular attention to writing. Rus 203 H satisfies the PSU BA requirement and prepares students to enter Rus 301H.

## Rus 203 -Second-Year Russian Term3 (4)

Intensive review ofbasic materials introduced in first-year programand further development of communication skills. This is the third course in a
sequence ofthree: Rus 201, Rus 202, and Rus 203. Expected preparation: Rus 103.

## Rus 203H-Second-year Russian Heritage ()

Designed forstudents who speak Russian but have limited writing skills. Covers the content ofsecondyear Russ ian 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 301 H- 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. Intensive practice in speaking listening, reading and writing. This is the third course in a
sequence ofthree: Rus 301, Rus 302, and Rus 303. Expected preparation: Rus 203.

## Rus 303H- Third-year Russian Heritage ()

Des igned for students 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 325 - Russian Phonetics and Phonology (4)

 Introduction to the sounds of Russian: 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 203.
## 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 their times and on how subsequent generations have reinterpreted and reused them. Taught in English.

## Rus 331 U- Russian Film Topics (4)

Surveys cinematic narratives significant to Russian culture, with a focus on issues 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 non-native 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 non-native 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 (112)

(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 Russian grammar; selected writing and reading assignments and discussion. 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 forcredit. .

## 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 ofthree: 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 forcredit. .

## 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 forcredit. .

## Rus 414 - Advanced Russian Grammar (4)

Systematic study of Russiangrammar 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 forcredit..

## 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 corequisite courses. Students taking a corequis itecourse will do part of the required reading forthatcourse in Russian. Expected preparation: Rus 342.

## Rus 420 - Topics in Russian History (4)

A content-based language course based on study of major issues in Russian and Soviet history such as Peter I, Westerners and Slavophiles, the Thaw, and others. May be repeated for credit when topics differ. Expected preparation: Rus 342.
Also offered for graduate-level credit as Rus 520 and may be taken only once forcredit. . Prerequisite: juniorstanding..

## Rus 421 - Topics in Contemporary Russian Culture (4)

Study of currentissues in post-Soviet society such as political processes, 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 forcredit. .
Rus 427 - Topics in Russian Literature of the 19th Century (4)
Representative literature of the major Russian 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 forcredit when topic differs.

Also offered for graduate-level credit as Rus 533 and may be taken only once forcredit. .
Rus 441 U- Russian Literature in Trans lation: Nineteenth Century (4)
Major works of nineteenth-century Russian literature. Readings, lectures, and discussion in English. Expected preparation: Sophomore Inquiry or 4 credits of upperdivision literature.

## Rus 442 -Russian Literature in Translation:Twentieth Century (4)

Major works oftwentieth-century Russian literature. Readings, lectures, and discussions in English.

## 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 Univers ity 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 Russian Flagship Program.

## Rus 445-FlagshipStudies: Globalization Term 2

 (2)A Russian across the curriculum course 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 second course in a sequence of three: Rus 444, Rus 445, and Rus 446.

Prerequisite: admission to the Russian Flagship Program.

## Rus 446 - FlagshipStudies: Globalization Term 3

 (2)A Russ ian 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 third course in a sequence of three: Rus 444, Rus 445, and Rus 446.
Prerequisite: admission to the Russian Flagship 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.
Prerequisite: admis sion to the Russian Flagship Program.

## Rus 455-FlagshipStudies:European Studies (2)

A Russ ian across the curriculumcourse aligned with PSU's University Studies Program. Flagship students perfect advanced reading, writing, speaking and listening skills while exploring the modern European history and culture in Russian.
Prerequisite: admission 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 theirrespective majors. This is the first course in a sequenceof three: Rus 457 , Rus 458, and Rus 459.
Prerequisite: admis sion 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 theirrespective majors. This is the third course in a sequence of three: Rus 457, Rus 458, and Rus 459.
Prerequisite: admis sion to the Russian Flagship Program.

## Rus 459 -FlagshipStudies: Russian in the Major Term 3 (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.
Prerequisite: admis sion 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, syntaxand morphology of modern Russian. Recommended prerequis ite: Rus 303.

## Rus 497 - Applied Russian Linguistics (4)

A practical application oflinguistics to modern Russian. Emphasis on a contrastive analysis 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 -Selected Topics (1-12)

(Credit to be arranged.)

## Rus 511 -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 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 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 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 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 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 Russian 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 issues in Russian and Soviet history such as Peter I, Westerners and Slavophiles, the Thaw, and others. May be repeated for credit 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: juniorstanding..

## Rus 521 - Topics in Contemporary Russian Culture (4)

Study of current is sues in post-Sovietsociety such as political processes, educational reform, migration, and others. May be repeated forcredit when topics differ. Expected preparation: Rus 342.
Also offered for undergraduate-level credit 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 Russian 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 forcredit 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. Analysis of the phonetics, phonemics, syntaxand morphology of modern Russian. Recommended prerequisite: Rus 303.

## Rus 597 - Applied Russian Linguistics (4)

A practical application oflinguistics to modern Russian. Emphasis 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 Univers ity Studies Sophomore Inquiry course that serves as the gateway to the Science in the Liberal Arts curriculum. The course aims to introducestudents to the knowledge-making
strategies of science. The curriculum is taughtusing small 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 knowledge claims, working collaboratively, writing technically, and communicating scientific results.

## Sci 311U-Teaching Everyday Science (4)

Two-term sequence 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 futureteaching experiences. In addition to experiences in the laboratory, environmental impact is sues will be investigated. Includes laboratory and/or fieldwork. This is the first course in a sequence of two: Sci311 and Sci312. Recommended prerequisite: Natural Science Inquiry.

## Sci 312U-Teaching Everyday Science (4)

Two-term sequence designed to immerse potential mathematics andscience 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 futureteaching 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: Sci 311 and Sci 312. Recommended prerequisite: Natural Science Inquiry.

## Sci 313U-Environmental Mathematical Modeling (4)

An introduction to differential and integral calculus, this course is intuitive in approach and emphasizes 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 issues, using real data. Topics will include statistics, data display, data analys is, pro bability, 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 astronomy. Emphasis 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 solarsystem. Survey ofthe stars, theirtypes, grouping, and motions. Models for the evolution of the Universe and the possibility oflife 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 oftwo: Sci315U 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 ofPhysics.
Cross-Listedas: Ph 361U.

## Sci 316U-General Astronomy II (4)

Introductory historical, descriptive, and interpretive study of astronomy. Emphasis 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 solarsystem. Survey of the stars, their types, grouping, and motions. Models for the evolution of the Universe and the possibility oflife 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 second course in a sequence of two: Sci315U and Sci316U. This is the same course as Ph 362 U and may be taken only once for credit. Expected preparation: Natural Science Inquiry. Taught by a faculty member from the Department ofPhysics.
Cross-Listed as: Ph 362U.

## Sci 317U-Fractals, Chaos, and Complexity (4)

Introduction to the physics of fractals in nature, chaos, and complexity. Computer simulations and desktop experiments involving fractals, chaos, and complex systems. Recommended prerequisite: NaturalScience Inquiry. Taughtby a faculty member from the Department ofPhysics.

## Sci 318U-Complexity and the Universe I (4)

Introduction to the physics of complexity and other current concepts in physics. Computer simulations and desktopexperiments in volving fractals, chaos, and complexsystems. Includes laboratory and/or
fieldwork. Recommended prerequisite: Natural Science Inquiry. Taught by a faculty member from the 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 as tronomy 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 res ources for preservice teachers.

## Sci 321 U-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 ofenergy resources, methods of producing and converting various forms of energy, energy conservation, and environmental and economic implications ofenergy 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 hydrogen's image as an abundant, clean, high energy output, easily obtainable, safe energy source. Considers safety is sues and codes/standards from various related agencies and organizations that would have been necessary to have avoided such historical mishaps as those involving the Hindenberg and the space shuttle Challenger. Recommended prerequisite: Natural Science Inquiry.

## Sci 327U- Oceans and Society (4)

Provides a working knowledgeofhow 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 331 U- 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 sequence of two: Sci 331 and Sci 332. Recommended prerequisite: NaturalScienceInquiry.

## Sci 332 U-AI: Urban AirPollution (4)

Interaction of the atmosphere with other earth systems, chemical cycling, and the effect of chumans on the atmos phere 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 second course in a sequence of two: Sci 331 and Sci 332. Recommended prerequis ite: Natural Science Inquiry.

## Sci 333U-Climate and Water Res ources (4)

An inquiry-basedexamination 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 from ice 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 every day life. Includes laboratory and/or fieldwork.
Cross-Listed as: Also offered as Geog 312U and may betaken only once for credit..

## 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 was tewater 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 was tewater 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 oftwo: Sci335 and Sci 336. Recommended prerequisite: Natural Science Inquiry.

## Sci 338U-Investigating Forest Ecosystems (4)

Fundamental concepts of terres trialecology in the context of present unresolved forest management is sues. Participants will learn an appropriate set of field skills in soil and vegetation monitoring and
engage in a short-termresearch 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 orenvironmental science course..

## Sci 341L-Lab for Bi 341 (0)

Lab for Bi 341.
Corequisite: Sci341U.

## Sci 341 U-Biology Concepts and Applications I (4)

Two-term course focusing on four main topics: classicalMendelian 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 first course in a sequenceoftwo: Sci 341 and Sci 342. Recommended prerequisite: Natural Science 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: classicalMendelian and current moleculargenetics, 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: Sci341 and Sci342. Recommended prerequisite: Natural Science Inquiry.

Corequisite: Sci 342L.

## Sci 343U-Columbia Basin Plant Communities (4)

In this two-term coursestudents 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 Science Inquiry.

## Sci 345U-Old Growth Forest Ecology and Management I (4)

Explores the ecologicalcharacteristics of old growth forests, including theoutstanding 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 aspects of forest management. Sci 345 includes laboratory and local fieldwork plus projects involving: analysis of environmental impact statement alternatives, evaluation of management issues, and advisory statements for governmental activities. Sci 346 involves more extensive fieldwork, data analysis, and presentations. This is the first course in a sequence of two: Sci 345 and Sci 346. Recommended prerequisite: Natural Science Inquiry.

## Sci 346U-Old Growth Forest Ecology and Management II (4)

Explores the ecologicalcharacteristics of old growth forests, including theoutstanding 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 aspects of forest management. Sci 345 includes laboratory and local fieldwork plus projects involving: analysis of environmental impact statement alternatives, evaluation of management is sues, and advisory statements for governmental activities. Sci 346 involves more extensive fieldwork, data analysis, and presentations. This is the second course in a sequence of two: Sci 345 and Sci346. Recommended prerequisite: Natural Science Inquiry.

## Sci 347U-Science, Gender, and Social Context I

 (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 Sci 348 U ; can be taken in any order.
Cross-Listedas: 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 organismal, cell/molecular, orbiomedical sciences. Laboratory and/or field experiences are included and emphasized. Companion course to Sci347U; 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 issues. Courses also address the historical and cultural role of science and technology, providing a link between laboratory science and contemporary society. Some CSS courses introducerisk-benefit analyses and decision-making methodologies. The prerequisite course for Context of Science in Society courses is Sci 201 NaturalScience Inquiry or consent of the instructor.

## Sci 351 U-Northwest Wetlands: Conservation, Restoration, and Mitigation (4)

Focus on science and public policy is sues in wetland conservation, restoration, and mitigation, especially in Oregon and the Pacific Northwest. Recommended prerequis ite: Natural Science Inquiry or consent of instructor.

## Sci 352 U-Science and Policy 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 existenceand impacts of globalwarming. The interaction between scientific analysis and policy analysis will be explored, and students will consider the roles that citizens, scientists, and policy make in developing local, regional, and global responses 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 power generation, wastedisposal and nuclear dis asters; medical x-rays and nonionizing radiation frommicrowaves 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 for credit..

## Sci 354U-Science and Politics of Columbia River Decisions (4)

Exploration of case studies of relationships between science and politics in making decis ions about controversial Columbia River management is sues. Students will identify a particular issue and its related stakeholders, define objectives, collectas wellas 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: Natural Science Inquiry. Also listed as Ph 378; coursemay be taken only once for credit.

## Sci 356U-Environmental Success Stories (4)

A positive reflection on how and why we can approach environmental catastrophes 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 problemsolving. 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 StatesMexico 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. Particularattention is paid to the manner in which such advances are likely to affect women's lives. Recommended prerequisite: NaturalScienceInquiry.

## Sci 361 U-Science: Power-Knowledge (4)

Systematically examines orthodoxportrayals of science in comparison to recent anthropological, feminist, and poststructuralistaccounts in an attempt to formulate a fresh understanding of the public's science literacy as a critical component ofdemocratic political practice and civic res ponsibility. Recommended prerequisite: Natural ScienceInquiry.

## Sci 365U-The Science of Gendered Bodies (4)

The scientific gendering of the human body is studied from an interd isciplinary and intersectional queer and feminist perspective integrating biology, health and medicine with current and his torical 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 382 U-Introduction to Nanoscience and Nanotechnology (4)

Basic introduction to nanoscienceand nanotechnology for all interested science, engineering and social science and humanities students. This is the same course as Ph 382 U and may be taken only once for credit.
Prerequisite: sophomore inquiry - NaturalScience 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 383 U and may be taken only once for credit.

Prerequis ite: 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 partofPH 382U (cross listed SCI 382U), it provides a scientific/technologicalbasis 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.)

## Sci415-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 programof 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-divisionstanding..

## 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 programof short lectures, labs, and student projects.
Also offered for graduate-level credit as Sci 516 and may be taken only once forcredit. . 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 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 programof short lectures, labs, and student projects.
Also offered for graduate-level credit as Sci517 and may be taken only once forcredit. . Prerequisite: upper-divisionstanding..

## 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 -SelectedTopics (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 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 programofshort lectures, labs, and student projects.
Also offered for undergraduate-level credit as Sci415 and may be taken only once for credit. . Prerequisite: upper-divisionstanding..

## Sci 516 -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 programofshort lectures, labs, and student projects.
Also offered for undergraduate-level credit as Sci 416 and may be taken only once for credit. .Prerequisite: upper-divisionstanding.

## Sci 517 -Understanding the Next Generation Science Standards : Interactions and Systems (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 programof short lectures, labs, and student projects.
Also offered for undergraduate-level credit as Sci 417 and may be taken only once for credit. . Prerequisite: upper-divisionstanding..

## 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 scienceeducation 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 covera wide range of environmental and scienceeducation 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) <br> (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 -SelectedTopics (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)

Provides a comprehensiveoverview 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 comparison of modes of sociological thinking, from the emergence of a distinctives ociological pers pective through sociological theory of the mid-twentieth century. Recommended: Soc 200.

## Soc 301 -ClassicalSociological Theory (4)

Examination and comparison of modes of sociological thinking, from the emergence of a distinctive sociological pers pective through sociological theory of the mid-twentieth century. Recommended: Soc 200.

## Soc 302 - Contemporary Sociological Theory (4)

Developments in American sociological theory from mid-twentieth century to today. Considers impact of social change and social movements on theory, including neo-Marxism, feminism, post-modernism and 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 ins titutions as the economy, religion, education, and the family are explored. Attention given to comparis on with other industrialized countries as well as to selected social is sues 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. W orld systems are treated not only as world orders made up of political and economic exchanges, butalso as cultural orders and institutionalized structures transcending national geographic boundaries. Attention given to the international, national, regional, and localways that people attempt to deal with the instabilities accomp anying 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 dimens ions of food systems and food behaviors. Social determinants of
hunger, malnutrition, and obesity. Exploration of solutions at the local, societal and global level.

## Soc 337U- Prejudice, Privilege, and Power (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 the study 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 his torical 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 analys is; a review of the development of population theories, techniques of measurement and analysis of the basic demographic variables, their interrelationships, and population changes. Recommended prerequisites: Soc 200.

## Soc 342 -Social Psychology: Self, Attitudes and Social Influence (4)

Examination of psychological and sociological processes associated 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 .

## Soc 343 -Social Psychology: Social Relationships and Groups (4)

Examination of sociological and psychological processes associated 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 organization of and individual expressions of sexuality. The course explores 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 life-transitions (leaving home, education, work, partnering, and having children)

## Soc 370 -S ociology of Deviancy (4)

Introduction and analysis of deviant behavior. Delineation of the sociological and social psychological 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 the evolution and transformation of society, with special emphasis on the operation of such factors since 1800 . Recommended prerequisites: Soc 200.

## Soc 380U- Sports in Society (4)

An objectiveexamination of sports in America as socialphenomena. Study of various socio-cultural structures, patterns, and organizations or groups involved with sports. Is sues such as race, gender, and class within the context of sports will be explored through a critical sociological lens.

## Soc 396 -S ocial Res earch Methods, Social Statistics (4)

Introduction to the range oftechniques for analyzing socialsciencedata. Emphasis on the conceptualization, operationalization, and
measurement of socially based phenomena. Topics include: level of measurement, operationalization, summary statistics, probability, hypothesis tests, and the use of data analysis software (SPSS).

## Soc 397 -Social Res earch Methods (5)

Study of the structuring of sociological inquiry, conceptualization and measurement, operationalization, computers in social research, analys is of bivariate and multivariaterelations, the logic of sampling and inference. Course includes lecture (4 hours per week) and an introductory research laboratory ( 2 hours per week).
Prerequisite: Stat 243. Expected preparation: Soc 200, 301, 302 ..

Soc 397L-S ocial Res earch Methods Lab (0)
Lab for Soc 397.
Corequisite: Soc 397.

## Soc 398 -Sociology Research Project (4)

Development and execution of a research project integrating some aspect of sociological theory with social scienceresearch 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 - Res earch (1-6)

(Credit to be arranged.) Consent of instructor.

## 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 ins tructor.

## 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. Consentof 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 is sues 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 Illness (4)

An overview ofsociological perspectives on mental health and illness. Informs understanding of mental health and illness by challenging dominant views of mentalillness, examining how social relationships play a role in mental illness, questioning the goals and implications ofmental 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 forcredit. .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 organization 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 forcredit. .

## Soc 423 -Stratification (4)

Survey and analysis ofstratification 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 forcredit. .

## Soc 424 -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 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 for credit. . Prerequisite: juniorstanding.. Cross-Listed as: WS 425.

Soc 426-Gender \& Mental Health (4)
Social and historical explanations of, and research on, 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.. Prerequis ite: Upper-divis ion 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 ofgender 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/s exuality 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 mains treaming of bias crimes and the ideology behind them. Includes analysis of propaganda and coded language in the popular media and the Internet, analysis 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 436U-S ocial 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. Recommended 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 sociallife and public policies are highlighted, including population aging, economic development and theenvironment, 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. Cons ideration of the consequences of changing definitions for intergroup and global relations. 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 scienceres earch on demographics of immigrants, immigration policy, immigrant incorporation, and the impact of immigration on the receiving society.
Prerequisite: Soc 200 or Soc 337U..

## Soc 448 -Sociology of Education (4)

Developmentof 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 ofeducation. 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 with in highereducation 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 issues in highereducation, access to college, Affirmative Action, standardized testing, and class, 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 ofequal opportunity, US public schools produce vast inequalities in educational outcomes compared to other nations. Why? The course 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 theaction 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 graduate-level credit as Soc 554 and may be taken only once for credit. . Prerequisite: Soc 200, Soc 310, or Soc 320..

## 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 inter-organizational dynamics and of the rationalization ofmodern 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, consumerhealth beliefs and motivations, and integration with mainstreamallopathic medicine; philosophical, historical and politicaldimensions; theories of health and illness; evidence-based research vs. traditional and folk beliefs; and a cons ideration of benefits and limitations considering the growing popularity. Not a course about how to practice any formofalternative medicine. Expected preparation: Soc 200.
Also offered for graduate-level credit as Soc 562 and may be taken only once forcredit. .

## Soc 463-Global Inequalities and Health (4)

An examination of international health inequalities from social, political and economic perspectives. The impact of globalization, transnationalis mand migration on population health. Inequalities within and between countries and regions, and the social dynamics 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 with in the United States and globally. Examination of the social forces which lead to the consideration and implementation ofmechanisms 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 the experienceof 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 graduate-level credit as Soc 566 and may be taken only once forcredit.. Prerequis ite: Upper-divis ion 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 ofdemocracy 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 forcredit. .

## Soc 480 -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 ofsect 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 for credit. .

## 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 insurgent movements. It will examine the role of Islam 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 analys is, and report writing. Expected preparation: Stat 243 and Soc 397, Soc 398 or equivalent.

Also offered for graduate-levelcredit as Soc 597 and may be taken only once forcredit. .

## Soc 501 -Research (1-9)

(Credit to be arranged.) Consent of ins tructor.

## 502 - Independent Study (1-9)

(Credit to be arranged.)

## Soc 503 -Thesis (1-9)

(Credit to be arranged.) Pass/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 ins tructor.

## Soc 507 -Seminar (1-6)

(Credit to be arranged.) Consent of instructor.

## Soc 509-Practicum(1-9)

(Credit to be arranged.)

## Soc 510 -SelectedTopics (1-9)

(Credit to be arranged.) Maximum: 12 credits. Consentofinstructor.

## Soc 513-Thesis Workshop (1)

Works hop 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 prerequis ite: graduate status in sociology. Corequisite: Soc 503. Pass/no pass only.

## Soc 518 -Criminology and Delinquency (4)

Social and legal meaning of crime and delinquency explored. Historical and contemporary theories of causes oflaw breaking reviewed. Social and cultural factors promoting and inhibiting law breaking by juveniles and adults are examined. Attentiongiven 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 IIIness (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 critical explanations for growth and change in urban regions are examined. Patterns ofsocial and structural organization of the metropolis and the cognitive and behavioral aspects 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 ofstratification 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-level credit 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 individual identity. 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 orPsy 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 for credit.
Also offered for undergraduate-level credit 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 mental illness 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 for credit.
Also offered for undergraduate-level credit as Soc 426 and may be taken only once for credit.. CrossListed as: WS 526.

## Soc 527 -Gender and Work (4)

Consideration of the theoretical, methodological, and empirical contributions of currentscholarship in the area of gender and work. Emphasis 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 once for 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 analysis of propagandaand coded language in the popular media
and the Internet, analysis of the grass-roots response 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 thesetechniques. Most useful for students engaged in data collection.
Also offered as Soc 637 and may be taken only once for credit.. Prerequisite: Soc 592.

## Soc 538 - Integrating Qualitative and Quantitative Methods (4)

Research designs for combining qualitative and quantitative methods thathavereasonably wellunderstood benefits, and can be implemented in a relatively straightforward fashion. The value of pragmatismas a philosophical paradigm for 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 researchus ing 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 639 and may be taken only once for credit..

## Soc 541 - 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 theenvironment, 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-level credit 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. Cons ideration of the consequences of changing definitions for intergroup and global relations. Expected preparation: Soc 200.

Also offered for undergraduate-level credit as Soc 444 and may be taken only once for credit. .

## Soc 548 -Sociology of Education (4)

Developmentof 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 with in highereducation 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 issues in highereducation, access to college, Affirmative Action, standardized testing, and class, race, and gender-based differences in individual educational outcomes and retention.
Also offered for undergraduate-level credit as Soc 450 and may be taken only once for credit. . Prerequisite: sophomore standing orhigher; Soc 200..

## Soc 552 -Education and Equality: Comparing the US, Asia, Europe (4)

Despite the promise ofequal opportunity, US public schools produce vast inequalities in educational outcomes compared to other nations. Why? The course examines the impacts of tracking, testing, teaching styles, race, class, and gender in the US through comparis ons 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 theaction 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 inter-organizational dynamics and of the rationalization ofmodern 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 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 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-level credit 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, consumerhealthbeliefs 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 resourceuse 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 the experienceof dying, how medical perspectives affect the experience ofdying, 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-Sociology of Aging (4)

A study of socialdeterminants 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-level credit 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. Analysis 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 instructor. Recommended prerequisite: 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 therole ofbiotechnology, agribusiness, and low-input peasant agriculture. Case studies examine social movements around land and food in the global South andNorth. Concludes with alternative models andemerging paradigms, including food sovereignty and food justice.
Also offered as Soc 679 and may be taken only once for credit..

## Soc 580 - Sociology of Religion (4)

Analysis of the nature of the sacred; attitudes toward the sacred in contrast to thesecular. Comparis on of the social organization ofsect 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 insurgent movements. It will examine the role of Islam and tribalis min 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, environmental hazards, social construction of medical knowledge, health care occupations, U.S. health policy, privatization of medicalindustries, 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 once for 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 include medicalization of women's bodies, the social consequences of dis parities, and current public policy debates about reducing disparities. Expected preparation: Soc 459/559.

Also offered as Soc 686 and may be taken only once for 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 Sus tainability 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 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 688 and may be taken only once for credit..

## Soc 590 -Social Res earch Strategies (4)

Consideration of the nature of sociological knowledge; elements of social research 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 prerequis ite: Soc 470 and graduate status.

## Soc 592 -Qualitative Methods (4)

Strategies for acquisition and analysis of data using such approaches as participant observation, content analys is, field and case studies. Attention to the special problems of validity and reliability in such research. Consideration ofethical is sues and researcher responsibility in qualitative research. Recommended prerequis ite: graduate status.

## Soc 593 -Quantitative Methods (4)

The application of quantitative methodology to sociological problems. Topics include: science and logical empiricism; measurement of as sociation; procedures ofstatistical inference; multivariate and log linear analysis; computer application for social research. Recommended prerequisites: Stat 243, 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 -Res earch Practicum (4)

Overview of the process of linking sociological data and ideas to broader communities of interest. Exercises in preparation of research grants and experience in working in a team research environment. Recommended prerequisites: Soc 590, 591; graduate status.

## 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, interviewing techniques, coding and computer
analys is, and report writing. Expected preparation: Stat 243 and Soc 397,398 or equivalent.

Also offered for undergraduate-level credit 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 their standards of living. Topics include how different economic classes 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 resisting 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) identifying the social conditions that affect psychological well-being and (2) describing the processes linking the social conditions to theirpsychological effects. 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 mentalillness.

Prerequisite: Graduate studentstatus 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 ofgender inequality.
Also offered as Soc 528 and may be taken only once for 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 thesetechniques. Most useful for students engaged in data collection.

Also offered as Soc 537 and may be taken only once for credit.. Prerequis ite: Soc 592.

Soc 638 - Integrating Qualitative and Quantitative Methods (4)
Research designs for combining qualitative and quantitative methods thathave reasonably wellunderstood benefits, and can be implemented in a relatively straightforward fashion. The value of pragmatismas a philosophical paradigm for doing mixed methods research will also be considered.

Also offered as Soc 538 and may be taken only once for 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 once for credit..

## Soc 665 -Environmental Sociology (4)

Analysis of the types of social forces which frame the nature of environmental problems concerning resourceuse and distribution across spatial and geopolitical levels. 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 ofbiotechnology, agribusiness, and low-input peasant agriculture. Case studies examine social movements around land and food in the global South andNorth. Concludes with alternative models and emerging paradigms, including food sovereignty and foodjustice.
Also offered as Soc 579 and may be taken only once for credit.. Prerequis ite: None..

## Soc 684 -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 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, environmental hazards, social construction of medical knowledge, health care occupations, U.S. health policy, privatization of medicalindustries, 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 once for 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 ofdisparities, 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 once for credit..

## Soc 688 -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 measure and how to reach these goals, by examining models locally, nationally and internationally. We will look at best practices ofcity, 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-Listedas: ESR 692.

## Soc 694 - Analysis of the Impacts of Social and Management Practices on Ecosystem Services (4)

Examination of social forces and institutions that influence use and guide policy for management of ecosystemservices. Investigation of interjurisdictional 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 categorical dependent variables (i.e. logistic regression) and to nonparametric methods for analyzing data.

Prerequisite: Soc 585/Soc 685, Soc 593, and Stat 543 or equivalent..

Soc 695L-Advanced Methods in Sociology 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 affectthe security of communities and their standards of living. Topics include how different economic classes 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 resisting the adverseimpacts 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, and elementary readings. This is the first course in a sequence ofthree: Span 101, Span 102, and Span 103.

## Span 101M- First-year Spanish Modified (4)

An introduction to elementary Spanish. Emphasis on lis tening comprehension and oral practice, the elements of grammar, vocabulary building, and elementary 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, and elementary readings. This is the esecond course in a sequence ofthree: Span 101, Span 102, and Span 103.

## Span 102M- First-year Spanish Modified (4)

An introduction toelementary Spanish. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, and elementary readings.

Span 103 -First-Year Spanish Term3 (4)
An introduction toelementary Spanish. Emphasis on lis tening comprehension and oral practice, the elements of grammar, vocabulary building, and elementary 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 to elementary Spanish. Emphasis on lis tening comprehension and oral practice, the elements of grammar, vocabulary building, and elementary 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.

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Span 199-Special Studies (1-12)
(Credit to be arranged.)
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## 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 201 H - Second-year Spanish Heritage 0

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 ofbasic 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-yearprogramand 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 ofbasic 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 ad vanced 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 analys is 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 sequence in order.

## Span 301H- Third-year Spanish Heritage ()

Continued work on the Spanish language at intermediate-advanced level. Prepares student for upperdivision classes. Intensive grammarreview. Span 301 emphasizes listening comprehension and speaking. Recommended: Span 203. Span 302 emphas izes reading and writing. Highly recommended: Span 301. Span 303 emphasizes oral and written skills in order to prepare student for literary analysis and critical writing. Highly recommended: Span 301 and Span 302.

## Span 302 - Third-year Spanish (4)

Spanish language study to help develop advanced proficiency. Intensive grammar instruction in preparation forupper division courses in culture, linguistics and literature. Emphasis on speaking, listening comprehension, reading, and writing skills for analys is and research. This is the second course in a sequence ofthree: 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 intermediate-advanced level. Prepares student for upper division classes. Intensive grammarreview. Span 301 emphasizes listening comprehension and speaking. Recommended: Span 203. Span 302 emphas izes reading and writing. Highly recommended: Span 301. Span 303 emphas izes oral and written skills in order to prepare student for literary analysis 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 forupper division courses in culture, linguistics and literature. Emphasis on speaking, listening comprehension, reading, and writing skills for analys is 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 0

Continued work on the Spanish language at intermediate-advanced level. Prepares student for upper division classes. Intensive grammarreview. Span 301 emphasizes listening comprehension and speaking. Recommended: Span 203. Span 302 emphas izes reading and writing. Highly recommended: Span 301. Span 303 emphas izes oral and written skills in order to prepare student for literary analysis 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 $301,301 \mathrm{H}, 302,302 \mathrm{H}$, 303, or 303H..

## Span 312 -Introduction to Teaching Spanish (4)

Introduction to the field ofteaching Spanish. Students will explore current practices through observation and reflection, as well as research and discuss a variety of is sues related to Spanish languageteaching. Students will identify and articulate their own 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 His panic World (4)

Solid foundation in Spanish business vocabulary and cultural business concepts. Students will engage in situational role-play practices that will prepare them to successfully interact with today's growing Hispanic economies.
Prerequisite: 8 credits ofSpan 301, Span 302 or Span 303.

Span 314-Spanish in Social 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 trans lation of specialized subject matter, in particular political texts and economic and financial texts. Students have the opportunity to analyze critically, and to resolvecreatively, the problems involving such issues in translation as context, register, tone, and audience. Written translation is offered both from English to Spanish, and fromSpanish to English.

Prerequisite: 8 credits of any of theseclasses: 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 historical-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 the impact of the international industrialization of agriculture on rural populations in both Latin America and the United States.

Prerequisite: 8 credits of any of theseclasses: 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 andCivilization (4)

His torical 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)

His torical development of life, thought, and the arts in Latin America.

Prerequis ite: Eight credits of Span 301, Span 302, or Span 303..

## Span 341 - Pre-Modern Cultural and Literary Foundations (4)

Study ofmedievaland/or pre-Colombian cultural texts and practices that form the foundations of Spanish literary traditions.

Prerequisite: Span 301, Span 302, and 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 17 th 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 ofSpanish and/or Hispanic 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 - Pres ent-Day Cultural and Literary Expression (4)

Study of contemporary Spanish and/or Hispanic 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 - Res earch (1-6)

(Credit to be arranged.)

Span 404-Cooperative Education/internship(112)
(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 -SelectedTopics (1-12)

(Credit to be arranged.)

## Span 410U-Selected Topics (4) <br> (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 forgraduate-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 forcredit. . Prerequisite: Span 301, Span 302, and Span 303..

## Span 421 - Major Topics : Penins ular 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: Penins ular 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 forgraduate-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 ofSpain by authors such as Berceo, Gongora, Quevedo, Machado, Jimenez, and Cernuda.
Also offered for graduate-level credit as Span 523.. Prerequisite: 4 units ofSPAN 341, Span 342, SPAN 343, SPAN 344 or SPAN 345.

Span 427-Major Topics: Latin American Prose (4)

Study, analysis, and critique ofmajor prose works of Latin America by authors such as Garcia Marquez, Fuentes, Paz, Vargas Llosa, Mastretta, and Borges. The coursemay 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 ofmajor 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 critiqueofmajor 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 critiqueoffilms from IberoAmerica 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 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 critiqueof 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 for credit 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 critiqueof 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 ofselections 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 upperdivision 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 analysis of the sound systemand the grammatical system. Brief survey of the historical development, followed by an analysis of the phonetics, phonemics, morphology, and syntax of modern Spanish.
Also offered for graduate-level credit as Span 594 and may be taken only once for credit. . Prerequisite: Span 301, Span 302, Span 303, and Span 325.

## Span 495 -Spanish Dialectology (4)

Study ofSpanish 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. . Prerequis ite: Span 325..

## Span 497 - Applied Spanish Linguistics (4)

A practicalapplication of linguistics to modern Spanish. Emphasis on a contrastive analysis 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. . Prerequis ite: Span 301, Span 302, and Span 303..

## Span 498 -Spanish Syntax (4)

A practicalapproach to Spanish Syntax. Study and analys is of syntactical functions and sentence structure. Emphasis on modern grammatical theory and findings. Examination of dis course connectors. Expected preparation: 4 credits of linguistics.
Also offered for graduate-level credit as Span 598 and may be taken only once for credit. . Prerequisite: Span 301, Span 302, and Span 303..

## Span 501 -Research (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 -Selected Topics (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-level credit 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-level credit as Span 414 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 critiqueofmajor 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: Penins ular Drama (4)
Study, analysis, and critiqueof 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.. Prerequis ite: 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 ofmajor 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 critiqueofmajor prose works of Latin 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 critiqueoffilms from IberoAmerica 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-level credit 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 for credit when topics vary.

Also offered for undergraduate-level credit 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-level credit 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 divis ion literature.
Also offered for undergraduate-level credit 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/orSpain.

## 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 -Hispanic Multiple Genres (4)

Critical works of Latin American and/or Spanish authors.

## 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. . Prerequis ite: 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 analysis of the sound systemand the grammatical system. Brief survey of the historical development, followed by an analysis 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 thatdifferentiate the Spanish speaking world including official and unofficial varieties ofSpanish in Europe, the Americas, A frica, 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 practicalapplication of linguistics to modern Spanish. Emphasis on a contrastive analysis 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 practicalapproach to Spanish Syntax. Study and analys is of syntactical functions and sentence structure. Emphasis on modern grammaticaltheory and findings. Examination of dis course 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 pers on-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 aboutacademic course options, use their supports, expand their experiences on campus, discover career interests while on the job, speak up for thems elves within planning meetings, and set college 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 -Res earch (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 (112)
(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 specialeducation guided by the "CriticalConcepts" 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: Admission 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 conductingnonbiased, standardized, academic as sessments. Students will develop knowledgeand skills in: collecting relevant background information; selecting, administering, and interpreting assessments; developing academic goals and objectives; preparing meaningful reports; and conducting meetings to convey assessment results.

Also offered for graduate-level credit as SpEd 512 and may be taken only once for credit.. Prerequisite: Mth 211, Mth 212, SpEd 418, and admis sion 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 Disabilities Education Act (2004), and their impact on service provision forstudents with disabilities. Issues of ethics, inclusion, and diversity are integrated within this course. Application of Oregon Adminis trative Rules will be highlighted.

Also offered for graduate-level credit as SpEd 514 and may be taken only once for credit.. Prerequisite: Admission to the Special Educator Licensure Programor MS in Special Education.

## SpEd 415-Classroom Assessment, 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: Admission to the Special Educator Licensure Programor MS in Special Education.

## SpEd 416-Classroom Ass essment, Ins truction, and Behavior Management (Secondary) (4)

Establishing effective instructional environments through research-based techniques ofbehavior management, assessment, and instructional delivery.

Also offered for graduate-level credit as SpEd 516 and may be taken only once for credit.. Prerequisite: Admission 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 theuse of evidence-based teaching practices in specialeducation. 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 specialeducation 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 SpEd 518 and may be taken only once for credit. .
SpEd 419-Principles of Special Education (3)
Prepares students entering special education with bas ic knowledge, skills, and values necessary for future success in their profession. Majoroverview of theory and research underlying delivery of special education services in the public schools. Intensive study of careerplanning, graduate writing and research, information systems, currentlegis lation, teaching and learning theory, curricular models, and professional ethics and standards. Expected preparation(or concurrentenrollment): Psy 311, SpEd 418.

Also offered for graduate-level credit as $\operatorname{SpEd} 519$ and may be taken only once for credit. .

## 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: SpEd 120, SpEd 220 and $\operatorname{SpEd} 320$..

## SpEd 422-Comprehensive Individualized

 Assessment and Curriculum I (3)Applies knowledge and skills for functional assessment and applied behavior analysis in the design and implementation of an individualized curriculum for individuals with significant and multiple disabilities. 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: Admission 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 curriculum for individuals with significant and multiple disabilities. 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 oftwo: SpEd 422 and SpEd 423.

Also offered for graduate-level credit as SpEd 523 and may be taken only once for credit.. Prerequisite: Admission to the program.

## SpEd 425 - Student Teaching (6-15)

This full-time student teaching experience provides opportunities forstudents to apply, practice, and generalize concepts and skills learned in university courses. Students will have opportunities to observe
and participate in the responsibilities of the special educator, and further develop their skills in instruction and classroommanagement.

Also offered for graduate-level credit as $\operatorname{SpEd} 525$. Prerequisite: Mth 211, Mth 212, SpEd 418 and admission to program. Corequisite: SpEd 426.

SpEd 426 -IEP and Collaborative Teaming (4)
This course is aboutthe processes and skills involved in collaborative teaming and consultation with in schools settings. Throughout the student teaching experience, course participants will learn about their role in the IEP process, experience a full range of professional responsibilities including instructional and non-instructional 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 admission 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, administrators and service personnel in the context of culturally diverse schools and communities. Careful examination of the IEP process will help define requisite case management skills and effective meeting facilitation skills that promote productive teaming processes.

Also offered for graduate-level credit as SpEd 527 and may be taken only once for credit.. Prerequisite: Admission to the Special Educator Licensure Programor MS in SpecialEducation.

## SpEd 430 -Families and Advocacy (3)

This course investigates practical strategies in the areas ofstudent support and advocacy, school-family collaboration and transition planning. Pers oncentered planning and teaching self-determination skills will be addressed. 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: Admission to program.

SpEd 431 -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 pers on-centered 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 $\operatorname{SpEd} 531$ and may be taken only once for credit.. Prerequisite: Admission to the Special Educator Licensure Programor MS in SpecialEducation..

## SpEd 432 - Inclusive Practices (2)

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.
Also offered for graduate-level credit as $\operatorname{SpEd} 532$ and may be taken only once for credit.. Prerequisite: Mth 211, Mth 212, SpEd 418 and admission to the program.

## SpEd 433-Math Assessment 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 graduate-level credit as SpEd 533 and may be taken only once for credit.. Prerequisite: Admission to the Special Educator Licensure Programor MS in Special Education..
SpEd 437-Reading Ass essment and Instruction (Elementary) (3-4)

Teacher candidates will develop a foundation in research-based instruction for reading to children prekinderg arten 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: Admission to program.

SpEd 438-Reading Ass essment and Instruction (Secondary) (3-4)
Develop the knowledge base and skills for effectively teaching reading skills to students with high incidence disabilities in schools. Address instructional methods for students who are emergent, developing, and more fluent readers and writers.

Explore the use ofresearch-based reading programs and other literacy materials in grades 6-12.

Also offered for graduate-level credit as SpEd 538 and may be taken only once for credit.. Prerequisite: Admission 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 disability in the field of special education. Students will examine theirviews of disability through analysis of texts produced by writers with disabilities and the examination of society's treatment of persons with disability.

Also offered for graduate-level credit as SpEd 539 and may be taken only once for credit.. Prerequisite: Upper-divis ion standing..

## SpEd 448-Positive Behavior Support in the Class room (3)

This course will teach research-based strategies within a positivebehavior support framework to promote desired classroombehavior and maximize instructional time. Prevention, teaching and cons equence strategies (positive and corrective) will be taughtfor implementation ranging froms choolwide 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: Admission to the Special Educator Licensure Program.

## SpEd 455 -Working With LEP Children Who Have Special Needs (2)

Examine the currentresearch 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 graduate-level credit as 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 dis abilities. Students serve as counselor trainees, under the guidance of experienced outdo or specialists and teachers in a residential programlocated at the Mt. Hood Kiwanis Camp. Emphas is on learning from and about persons with dis abilities, teamwork with in
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 legal foundations for early 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 programorpermission of instructor.

Also offered for graduate-level credit as $\operatorname{SpEd} 580$ and may be taken only once for credit. .

## SpEd 481 - Family Guided Early Intervention (3)

Develops knowledgeand 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 dis abilities, including children with physical and sens ory impairments, children with health impairments, and children with autism.
Also offered for graduate-levelcredit 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 EI/SE to promote communication development for all children. Expected preparation: SpEd 480/580 and admission to program.
Also offered for graduate-level credit as 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: Upper-divis ion 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 (19)
(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 "CriticalConcepts" 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 for credit.. 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 conductingnonbiased, standardized, academic assessments. Students will developknowledge and skills in:collecting relevant background information; selecting, administering, and interpreting assessments; 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 for credit.. Prerequisite: Mth 211, Mth 212, SpEd 418 and Admis sion to program.
SpEd 513-Classroom BasedAssessment and Instructional Planning (3)
Informal, formative, ongoing assessment techniques for students with special needs in special and regular education settings. Using information from assessments to make instructional decisions and for IEP documentation and planning.
Prerequisite: 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 provision forstudents with disabilities. Issues of ethics, inclusion, and diversity are integrated within this course. Application of Oregon Adminis trative Rules will be highlighted.
Also offered for undergraduate-level credit as SpEd 414 and may be taken only once for credit..

Prerequisite: Admission to the Special Educator Licensure Programor MS in Special Education..
SpEd 515-Clas sroom Ass essment, Ins truction, 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 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-Clas sroom Ass essment, Ins truction, and Behavior Management (Secondary) (4)
Establishing effective instructional environments through research-based techniques ofbehavior management, assessment, and instructional delivery.
Also offered as undergraduate-level credit as SpEd 416 and may be taken only once for credit.. Prerequisite: Admis sion to the Special Educator 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 ofdiversities (including the talented and gifted) andeducational ramifications for the teacher.

Also offered for undergraduate-level credit 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 theirprofession. Major overview of theory and research underlying delivery of special education services in the public schools. Intensive study of careerplanning, 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 SpEd 419 and may be taken only once for credit. .

## 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 professionals. Information related to cultural competence is infused
throughout the course. In addition, students receive information on griefrelated 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 Curriculum I (3)

Applies knowledge and skills for functional assessment and applied behavior analysis in the design and implementation of an individualized curriculum for 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 522 and SpEd 523.

Also offered for undergraduate-level credit as SpEd 422 and may be taken only once for credit.. Prerequisite: Admission 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 second course in a sequence oftwo: SpEd 522 and SpEd 523.

Also offered for undergraduate-level credit as SpEd 423 and may be taken only once for credit.. Prerequisite: Admission to program.

## SpEd 524-Collaboration II: Schools and Inclusion Strategies (Mid-level/High School) (3)

Des igned to help preservice teachers learn collaborativestrategies that facilitate the inclusion of students with disabilities into the general education program.

## SpEd 525-Student Teaching (6-15)

Observation and teaching under the direction of a supervis ing teacher. Opportunities for assuming 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: Satis factory completion of SpEd

509 Directed Field Experience II.. Corequisite: SpEd 526..

## SpEd 526-IEP and Collaborative Teaming (4)

This course is aboutthe processes and skills involved in collaborativeteaming and consultation within schools settings. Throughout the student teaching experience, course participants will learn about their role in the IEP process, experience a full range of professional responsibilities including instructional and non-instructional roles, and prepare an edTPA portfolio.

Also offered for undergraduate-level credit 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, administrators and service personnel in the context of culturally diverse schools and communities. Careful examination of the IEP process will help define requisite case management skills and effective meeting facilitation skills that promoteproductive teaming processes.
Also offered for undergraduate-level credit as SpEd 427 and may be taken only once for credit.. Prerequis ite: 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. Curriculumand instructionalmethods 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: $\operatorname{SpEd} 519$, Ed 511, and admission 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 content enhancement devices to make curricular content more accessible for students with disabilities. Strategies for promoting retention, application, and generalization of content learning will also be examined.

Prerequisite: SpEd 519 and admis sion to program.

## SpEd 530 - Families and Advocacy (3)

This course investigates practical strategies in the areas of student support and advocacy, school-family collaboration and transition planning. Pers oncentered planning and teaching self-determination skills will be addressed. Course participants will examine collaborative skills needed to empower students and families to work effectively with school profes sionals in K-12 and transition settings.
Also offered for undergraduate-level credit as SpEd 430 and may be taken only once for credit.. Prerequisite: Admis sion to program.

## SpEd 531 - Families and Advocacy (Secondary)

 (3)Investigate practicals trategies, tools and exemplary practitioners in the areas ofstudent support and advocacy, school-family collaboration and transition planning. Address concepts and curriculumrelated to person-centered planning and teaching selfdetermination skills. Examine collaborative skills needed to empower students, families, service agencies, and other support systems to facilitate inclusive 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 ProgramorMS in Special Education..

## SpEd 532 - Inclusive Practices (2)

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.

Prerequisite: Admission to the program. CrossListed 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 assess 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 achievesuccess in school and beyond the secondary levels.
Also offered for undergraduate-level credit as SpEd 433 and may be taken only once for credit.. Prerequisite: Admission to the Special Educator Licensure ProgramorMS in Special Education..

## SpEd 536-SpecializedTechniques (3)

Information and skills development for meeting the specialized support needs commonly found with students with significant dis abilities. Focus on educational implications considering (1) the nature of the medical condition, (2) methods for instruction (i.e., positioning, mobility), and (3) procedures for structural modifications. Course incorporates information from various disciplines and is designed to assist the educator in becoming an effective member of a trans disciplinary team that serves students with routine and emergency medical and physical needs.
Prerequis ite: $\operatorname{SpEd} 418 / 518$ and admis sion to the program.

## SpEd 537-Reading Ass essment and Instruction (Elementary) (3-4)

Teacher candidates will develop a foundation in research-based ins truction for reading to children prekindergarten 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 as sessing core early literacy skills.

Also offered for undergraduate-level credit as SpEd 437 and may be taken only once for credit.. Prerequis ite: Admis sion to program.

## SpEd 538 -Reading Ass essment 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 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.. Prerequis ite: Admis sion to program.

## SpEd 539-Historical and Contemporary Issues in Disability Studies (4)

Examines howviews ofdisability in schools and other social contexts challenge traditional understandings of dis ability in the field of special education. Students will examine theirviews of disability through analysis oftexts 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 visualimpairments, common eye conditions, basic eye anatomy, and overview of instructional strategies with emphasis on the expanded core curriculum. Introduces Grade I braille and tactile graphics production. Addresses instructional considerations for diverse learners with vis ion loss, including additional dis abilities and deafblindness.
Prerequisite: $\operatorname{SpEd} 418 / \mathrm{SpEd} 518$ and admis sion to the program.

## SpEd 541 - Implications of Vision Problems of Children/Youth (3)

Anatomy, physiology, common dis eases, and hygiene of the human eye. Emphasis on vision screening, testing, and techniques for evaluation of functional visual skills in the classroom. Focus includes strategies for improving medical/ optometric eye reports. Emphasis on working with the regular classroomteacher regarding prevention of potential eye disorders and referral to eye specialists.
Prerequisite: SpEd 540 and admis sion to the program.

## SpEd 542 - Assessment of the Vis ually Impaired (3)

Examination and application of diagnostic and as sessment 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 program planning and implementation. Developmental areas include cognition, social/emotional skills, psychomotor skills, and self-help skills.

Prerequisite: $\mathrm{SpEd} 418 / 518$ and admission to the program.

## SpEd 543 - Reading and Literacy - Visually Impaired Learners (3)

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: Vis ually Impaired Learner (3)

Course focuses upon curricular adaptations for use with the visually impaired learner in the classroom. 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 multi-d is abled child.

Prerequis ite: $\operatorname{SpEd} 418 / 518$ and admis sion to the program.

## SpEd 545 -Introduction to Orientation and Mobility and Independent Living Skills (3)

Introduces the historical development and field of orientation and mobility (O\&M). Provides instruction in basic $\mathrm{O} \& M$ 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.

Prerequis ite: $\mathrm{SpEd} 418 / \mathrm{SpEd} 518$..
SpEd 546 - Braille I (3)
The Braille code is presented, to include Grade II literary Braille, and use of the abacus.

Prerequis ite: $\operatorname{SpEd} 540$ and admis sion to the program.

## SpEd 547 -Braille II (2)

All specials igns 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.

Prerequis ite: $\operatorname{SpEd} 546$ and admis sion 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 classroombehavior and maximize instructional time. Prevention, teaching and consequence strategies (positive and corrective) will be taught for implementation ranging froms choolwide 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. .
Prerequisite: Admission 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 visual impairments including those with additional dis abilities, deafblindness and/or from diverse backgrounds.

Prerequisite: SpEd 540, SpEd 541, SpEd 545..

## SpEd 550-Orientation and Mobility Ass essment and Instruction - Children (3)

Provides an overview ofO\&M as sessment 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 assessment 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 persons with visual impairments including those fromdiverse backgrounds, additional disabilities and deafblindness.

Prerequisite: SpEd 540, SpEd 541, SpEd 545..

## SpEd 553 -Leis ure Education for Pers ons with

 Dis abilities (3)Focuses on recreation and leisure as a major aspect of independent living and community adjustment. Roles of the schools in providing a comprehensive leisure education programforstudents with disabilities.
Prerequisite: $\operatorname{SpEd} 418 / 518$..

## SpEd 554 - Orientation and Mobility Practicum (3-12)

Minimum 350 hour supervised internship for preservice O\&M specialists with individuals with visual impairment, ranging fromschool-aged students to adult vocational and geriatric populations, including diverse learners with additional disabilities 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. Dis cus s political, social, and community concerns in working with LEP students with special needs.

Also offered for undergraduate-level credit 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 disabled students (elementary/youngadult); helps participants gain knowledge which strengthens vocational success for dis abled persons; and program models train pers ons with dis abilities in transition from schoolto community life.
Prerequisite: 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 technological methods specific to the needs of the community in such settings as schools, clinics, and homes.

## SpEd 559-Assessing Behavior (5)

Students will learn the fundamental elements of behavior assessment, how to identify behaviors appropriate for behavioral as sessment, selecting behavior goals and strategies, conducting indirect and direct as sessments to identify behavior function, and addressing professional issues that may arise during the process of behavioral as sessment.

## SpEd 560-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 serveas counselor trainees, under the guidanceof experienced outdo or specialists and teachers in a residential programlocated at the Mt. Hood Kiwanis Camp. Emphas is on learning from and 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 disabilities who engage in challenging behavior. Students learn how to apply the positive behavior support method and to choose appropriate and effective behavior-change strategies to address behavior goals. These include the use of technology and responses to ethical and professional issues in implementing behavior support plans.

## SpEd 562 - Ethical Is sues 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, systems of care, society). Although the class focuses on the

BACB's Professional and Ethical Compliance Code for Behavior Analysts, 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 moderate response deficits in reading.
Prerequisite: CI 474/574..

## SpEd 564 -Learning Disabilities (3)

Concepts, is sues, and major sources in the field of learning disabilities: definition, causation and identification, ability vs. task analysis models, perceptual training, and aptitude treatment interaction, early identification, and reading disability.

## SpEd 565 -Single-Subject Research Design in Applied Behavior Analysis (5)

Introduces students to the foundations of singlesubject research designs and the application of singlecase res earch methodology. The course content aligns with items on the BCBA TaskList (5th Edition). It provides students with the mosteffective experimental research methods to measure cuttingedge treatments, such as innovativetechnological interventions and positive behavior support.

## SpEd 566-Advanced Research Methods in ABA (4)

Students will demonstrate their knowledge and application ofs ingle-case research 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 management of overall intervention implementation, students will as sess the quality of implementation and intervention impact.

## SpEd 567 - ABA Leadership Capstone (3)

As a culminating experience forstudents 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® TaskList (5th ed.) on what behavior analysts should know about the science of 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 assessment and positive behavioral supports for students with challenging behavior.

Prerequisite: SpEd 521..

## SpEd 570-Communication Systems for Persons with Severe Dis abilities (3)

Course for students who will be teaching communication skills to persons with severe dis abilities, including nonverbal individuals. Examines specialized systems forteaching communication skills, normal speech, and implementation of communication instruction.

Prerequisite: 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 adolescence. Examines what middle and high school teachers need to understand about students with learning differences and how they can provide support and accommodations.

Prerequisite: admis sion to SDEP program. .
SpEd 573 - As sessment and Planning for Students With Mild Disabilities (3)
Examination and application of diagnostic and assessment instruments used to measure 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 - Vis ually Impaired Learner with Additional Disabilities (3)

Study of visually handicapped students with concomitant disabilities such as hearing impairments, mentalretardation, and behavior dis orders. Emphas is on curricular adaptations, teaching strategies, and behavior management.

Prerequis ite: 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 from school 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 577 -Interagency Collaboration (2)

Focuses on service coordination that unifies school personnel and community agencies to strategically use collective expertise to plan the transition from school 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 professionals.

## SpEd 580 - Introduction to Early Intervention/Early Childhood Special Education (3)

Provides historical, social, and legal foundations for early 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 includeall 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 knowledgeand skills necessary for providing early intervention services to infants and toddlers with developmentaldelay/disabilities and their families.
Also offered for undergraduate-level credit as SpEd 481 and may be taken only once for credit..

SpEd 582 -Specialized Techniques: 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 dis abilities, including children with physical and sens ory impairments, children with health impairments, and children with autism.
Also offered for undergraduate-level credit 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/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 - As ses sment: 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 testingusing 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 assessment, parentreporting, and family interviewing. Emphas is on the assessment process for the young child and the family's role in the as sessment of the young child with developmental delays or dis abilities.

## SpEd 585 - Instructional Strategies I: EI/SE (3)

Develops knowledge and practices forteaching 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, naturalis tic teaching strategies, dis crete trial teaching, and positive behavioral supports.
Develops knowledgeand skills for curriculum-based assessment, design of individual programplans, and use ofdata 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 knowledge of 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, socialemotional 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 mentalhealth 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 for credit..
SpEd 588 -Foundations of Applied Behavior Analysis (3)
Introduction to the Board Certified Behavior Analyst (BCBA) course sequence designed to prepare students to take theBCBA exam. Specifically designed to provide students with the knowledge of ABA terms as well as the application of positive behavior support and technological methods specific to the needs of your community. This is the first course in a sequence of six: $\operatorname{SpEd} 588, \operatorname{SpEd} 589$,

SpEd 590, SpEd 591, SpEd 592, SpEd 593 and must be taken in sequence.
Prerequisite: Admis sion to the PSUBCBA program.

## SpEd 589 - Behavioral Ass essment (5)

Designed fors students to learn the fundamental elements of behavior assessment, how to identify behaviors appropriate for behavioral assessment, selecting behavior goals and strategies, ethical and professional is sues that may arise during the process of behavioral as sessment. This is the second course in a sequence of six: $\operatorname{SpEd} 588, \operatorname{SpEd} 589, \operatorname{SpEd} 590$, SpEd 591, SpEd 592, SpEd 593 and must be taken in sequence.
Prerequisite: Admission in the PSU BCBA program; SpEd 588..

## SpEd 590-Positive Behavior Support (5)

This course is designed for students to learn the positive behavior support method, selecting appropriate and effective strategies to address behavior goals including the use of technology, and responding to ethical and professional issues that may arise during the processof implementing behavior support methods. This is the third course in a sequence ofsix: $\operatorname{SpEd} 588, \operatorname{SpEd} 589, \operatorname{SpEd} 590$, SpEd 591, SpEd 592, SpEd 593 and must be taken in sequence.
Prerequisite: Admission in the PSUBCBA program; SpEd 589..

## SpEd 591 -Single Subject Design (5)

This course in the single subject research method applies knowledge of applied behavior analytic interventions based on the Behavior Analyst Certification Board (BACB®) Foundational Knowledge List. This is the first of two research courses in the Board Certified Behavior Analyst (BCBA) sequence to prepare students to take the BCBA exam. This is fourth course in a sequence of six: SpEd 588, SpEd 589, SpEd 590, SpEd 591, SpEd 592 , SpEd 593 and must be taken in sequence.
Prerequisite: Admission in the PSU BCBA program; SpEd 588, SpEd 589, SpEd 590..

## SpEd 592 - Ethics in Applied Behavior Analysis

 (4)This course is specifically designed to provide students with the knowledge of ethics within the field of ABA as well as ethical application of positive behavior support and technologicalmethods specific to the needs of your local community identified in the technology project for this course. This is fifth course in a sequence of six: $\operatorname{SpEd} 588, \operatorname{SpEd} 589, \operatorname{SpEd} 590$, SpEd 591, SpEd 592, SpEd 593 and must be taken in sequence.

Prerequisite: Admis sion in the PSU BCBA program; SpEd 588, SpEd 589, SpEd 590, SpEd 591..

## SpEd 593 - Advanced Single Subject Design (4)

Designed forstudents to learn measurement and design considering behavior change, systemsupport, implementation, management, supervision and ethical and professional issues relevant to the practice of behavioral intervention and research design. This is sixth course in a sequence of six: $\mathrm{SpEd} 588, \mathrm{SpEd}$ 589, SpEd 590, SpEd 591, SpEd 592, SpEd 593 and must be taken in sequence.

Prerequisite: Admission in the PSU BCBA program; SpEd 588, SpEd 589, SpEd 590, SpEd 591, SpEd 592..

## SpEd 594 - Assessment Methods and Classification in Infant Mental Health (3)

Develop knowledgeand 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 assessment, and use ofclassification systems within the mental health 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. Emphasis 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 disturbances as well as those determined to be at risk. Includes a review of international, national, and regional established and pilot programs in early intervention and prevention. Assess and critically evaluate the current science around treatmentefficacy of various interventions.

## SpEd 596-Topics in Special Education Res earch (3)

Specialized topics in special education focused on the scientific process and the development of researchbased 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 Intervention Supports 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, evidencebased practices, the useof 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 Language Learners, Positive Behavior Intervention Supports, Students with Significant Disabilities.

## 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 (19)
(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 610 -Selected Topics (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 (09)
(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.)

SpEd 609-Practicum(1-9)
(Credit to be arranged.)

## SpHr 222 - Introduction to Speech, Language \& Hearing Sciences (4)

An overview of the field ofspeech, language and hearing sciences and its professions. Focus on the scientific basis of speech production, hearing perception and speech acoustics. Foundational information regarding language science will also be addressed. Emphas is on the scientific analysis 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 televis ion speakers, public speakers, and others who require special competence in speaking. Emphas is on both theory and practice. Two hours per week of laboratory work required.

## SpHr 365U-Survey of Speech, Language, and Hearing Dis orders (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 forgeneral 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 theirperception. Theacoustical 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 respiratory, phonatory, and articulatory systems for speech, with applications to speech dis orders. The phys iology of s wallowing and swallowing dis orders is also covered.

## SpHr 372 U- 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 froma 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 - Autism Spectrum Dis orders (4)

Examines current issues related to diagnosis and intervention forchildren and adolescents with autism spectrum dis orders (ASD). It focuses on current research related to theories of development across varied domains (social and communicative, motor, sens ory, cognitive and adaptive behaviors) and interdis ciplinary practice for serving children with ASD.

## SpHr 394 - Guided Obs ervation (1)

Designed to acquaint students with the clinical process in speech, language, and audiology cases. Students will observe phases of clinical operation including diagnostic management, parent conferencing, and material preparation.

## SpHr 395-DirectedClinical 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 supervis or. Students will participate in all phases of clinical operation, including scheduling, diagnostic management, parent conferencing, 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.)

## SpHr 401 - Research (0-15)

(Credit to be arranged.) Consent of instructor. Use 501 to register for comprehensive exams.

SpHr 402 -Independent Study (1-12)
(Credit to be arranged.)

SpHr 404-Cooperative Education/Internship (115)
(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 -Selected Topics (0-12)
(Credit to be arranged.)

SpHr 410H- (1-12)

## SpHr 432 -Alternative Medicine (4)

This course offers a general introduction to influential medicalsystems (i.e., Traditional Chinese Medicine, Western Homeopathy, Indian Ayurveda, etc.) in the world that are emerging in the U.S. as alternative medicines to the conventional (or allopathic) biomedicine. For senior level and graduate students of all majors who are interested in health and medicine, including those who are preparing formedicalorallied health professions like speech-language pathology.

## SpHr 452 -Screening in the $S$ chools (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 major deviations affecting verbal communication.

Also offered for graduate-levelcredit as SpHr 561 and may be taken only once for credit..

## SpHr 463 -Language Dis orders in Children (4)

An overview of developmentallanguage disorders in children. Disorders 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 Dis orders in Children (4)

Discussion of normal speech development and how it can differ in individuals with speech dis orders. 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: 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 thestudy of the relationship between linguistic processes and the human brain. Learn about language processing from psychological and neurological perspectives.
Expected preparation: Introductory understanding of linguistics and psychology is strongly recommended (Introduction to Linguistics and Introduction to Psychology).
Also offered forgraduate-level credit as SpHr 571 and may be taken only once for credit.. Prerequisite: SpHr 461 or equivalent..

## SpHr 473 - Pers pectives on Disability (4)

Introduces students to perspectives on disability and ableism. Students will examine definitions of disability 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 ofdis 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 graduate-level credit as SpHr 573 and may be taken only once for credit.. Prerequisite: Upper-division standing..

## SpHr 475-Introduction to the Professions of Speech-Language Pathology and Audiology (4)

Overview of topics related to professional development in speech-language pathology and audiology, including professional behavior, ethical responsibility, scope of practice, interdis ciplinary collaboration, professional affiliations, continuum of 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 dis orders. 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-Bilingualism and Communication

 Disorders (4)Introduction to typical bilingual/bicultural development and communication disorders. Addresses language, cognitive and social-emotional characteristics of bilingual children and adults with communication disorders. Discussions on clinical challenges and general assessment and intervention approaches when working with bilinguals with communication disorders in Speech-Language 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 measurement, 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 is sues will be included. Expected preparation: SpHr 488/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; staffseminars in case dispositions.
Maximum: 18 credits. Recommended prerequisite: 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: as sessment, 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 dis orders with emphas is on acquired neurogenic dis orders dueto stroke, traumatic brain injury, and neurodegenerative disorders (e.g., aphasia, dysarthria, right hemisphere syndrome).
Prerequis ite: 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 dis orders, with special cons ideration 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 573 - Perspectives on Dis ability (4)

Introduces students to perspectives on dis ability and ableism. Students will examine definitions of dis ability and thehis tory of disability, particularly as it relates to communication and clinical practice. We will inves tigate 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 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 503 -Thesis (0-9)

Consentof 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 (015)
(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 SpHr graduate students only. Students mustshow proof of professional liability insurance.

SpHr 510 -Selected Topics (0-15)
(Credit to be arranged.)

## SpHr 530 -Evidence-based Practices in Communication Dis orders (4)

Focuses on theevidence-based practices of assessment and intervention in communication differences and disorders. Specifically, principles of static and dynamic as sessment, intervention planning and implementation, goal writing and data collection- across communities and developmental stages. Emphasizes diversity, equity, and contextual influences on communication and social interaction. Restricted to graduate students.

Prerequisite: SpHr 370 and SpHr 463 ..
SpHr 540-Multicultural Topics in Communication Dis orders (2)

Introduces topics of communication disorders 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 for credit.

## SpHr 541 - Bilingual Topics in Communication Dis orders (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 dis ability, and as sessment and intervention topics for children and adults from bilinguallanguage backgrounds. Emphasis on Spanish-Englishbilingual populations.

## SpHr 545 - Pathways to Professional Practice (2)

Overview oftopics related to professional practice of speech-language pathology: professional org anization membership, certification, licensure, and ethical and legal responsibilities. Career developmentissues: preparing for national exams; résumé writing, interviewing, and planning for the Clinical Fellowship; team collaboration; 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 forthe American Speech-Language-Hearing A ssociation Code of Ethics. Explores complexity of professional practice of SLP that haveethicalconsiderations. Includes weekly group discussion to engage in ethical diagnosis using clinicalscenarios based on individuals with communication disorders.

Prerequisite: SpHr 530 ..

## SpHr 552 -Screeningin the Schools (1)

Students will participate, under supervision, in screening school-aged students for speech, language, and/orhearing disabilities.

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 fordevelopingeffective 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 speech-language pathology.

Prerequisite: SpHr 530 .
SpHr 554 -Advanced Speech Sound Dis orders: Theories and Application (4)
Developmentand disorders of speech sound production, with particular emphasis 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. Res tricted to graduate students.

## SpHr 555-Assessment and Treatment of Dysphagia in Adults 0

Introduction to dysphagia and related disorders in adults. Covers the following topics: 1) anatomy and physiology ofs wallowing; 2) types of acquired dysphagia;3) clinical swallowing examination; 4) common methods of instrumental swallowing examination, including radiographic studies, fiberendoscopic examinations and manometry; and5) Dysphagia Intervention.

## SpHr 556-Assessment and Treatment of Dysphagia in Pediatrics 0

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 s wallowing examination, including radiographic studies, fiberendoscopic examinations and 5) Dysphagia Intervention.

## SpHr 558-Symbol Systems in Early Communication (2)

Focuses on communication characteristics of individuals with severe communication disorders and their use of augmentative and alternative communication to meet both pre-intentional and intentional and symbolic communication needs. Emphasis on holistic communication assessment methods and intervention strategies to enhance communication in children.

Prerequis ite: 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 AACuse. Students gain knowledge and skills for treating children, adolescents, and adults with moderate to severe developmental or acquired dis orders in speech and language.
Prerequisite: SpHr 530 ..

## SpHr 560 - Res earch Methods in Communication Sciences andDis orders (4)

Introductionto research methods in communication sciences and disorders. Covers research strategies and designs commonly used in communication sciences and disorders, as well as methods used in the collection, analysis and interpretation of data. The course focuses on the application of research principles in the criticalevaluation of journal articles and other research literature, with the goal of enabling 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 mechanisms with special attention given to the major deviations affecting verbalcommunication.

Also offered for undergraduate-level credit as SpHr 461 and may be taken only once for credit..

## SpHr 562 -Cognitive Rehabilitation (4)

Discusses causes, symptoms, prevention, assessment, and managementof cognitive-communication disorders following acquired brain injury across the lifespan. Specific populations to be discussed include traumatic brain injury, stroke, and the dementias. Places emphasis onevidence-based clinical reasoning and applying the W orld Health Organization model to clinical management in rehabilitation settings. Restricted to graduate students.

## SpHr 563 - Adult Language Dis orders (4)

Presents theories of acquired language disorders in adults specific to aphasia rehabilitation, including causes, symptoms, prevention, as sessment, and management of aphasia in adults. Emphasis is placed on evidence-based clinical reasoning and applying the W orld Health Organization model to clinical management in a variety of rehabilitation settings.
Prerequis ite: 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; medical billing, reporting, and appeals; interdisciplinary models; evidence-based practices; common medications and theirside 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. Emphasis placed on evidence-based clinical reasoning and applying the World Health Organization model to clinical management in varied settings.
Prerequisite: SpHr 530 ..

## SpHr 567-Cleft and Craniofacial Dis orders (2)

Provides in-depth clinical management of children with cleft lip and palate and other craniofacial syndromes. Particular emphasis placed on identification, description, as sessment, and treatment of speech production, feeding, and psychosocial development. Explores evidence-based models of team care, including the role of other medical professionals.
Prerequisite: $\mathrm{SpHr} 370, \mathrm{SpHr} 371, \mathrm{SpHr} 530$, and SpHr 554.

## SpHr 568-Medical Speech Pathology II (2)

Covers advanced topics pertinentto assessment and treatment of speech and swallowing in individuals with respiratory impairments in a medical setting. Topics will include pulmonary function and defenses, types of respiratory impairments, tracheostomy, mechanical ventilation, and selected speech and swallowing interventions for individuals with respiratory impairments.
Prerequisite:For currentstudents in the SpeechLanguage Pathology Graduate Program, completion of SpHr 564 Medical Speech Pathology I is required. Forpracticing community clinicians with a Masters degree orhigher, no prerequisite is required..

## SpHr 570 -Audiometric Practicum (2)

Supervised clinical practicedesigned for Speech and Hearing Science majors. Practical training in basic pure-tone 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 from psychological and neurological perspectives. Expected preparation: Introductory understanding of linguistics and psychology is strongly recommended (Introduction to Linguistics and Introduction to Psychology).
Also offered for undergraduate-level credit as SpHr 471 and may be taken only once for credit..

## SpHr 581 -Stuttering (3)

Covers disorders offluency, including causes, symptoms, prevention, theories of stuttering, assessment, and management ofstuttering in pediatrics andadults. Emphasis is placedon evidence-based clinical reas oning and applying the World Health Organization model to clinical management in a variety of practical settings.
Prerequisite: SpHr 530 ..

## SpHr 582 - Voice Disorders (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 lifespan for organic and functional voice disorders.

Prerequisite: SpHr 530.

## SpHr 584 - Assessment and Treatment of Language Dis orders : 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, interdisciplinary assessment and intervention. All topics targetuse of evidence-based practices and the influence of context on performance.

SpHr 585-Assessment and Treatment of Language Dis orders 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 oflanguage-based disorders 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 spectrum dis orders (ASD). Focuses on current research related to theories of social, communication, motor, sens ory, cognitive, and adaptive behavior development. Emphasizes 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 disorders, perspectives in teaching literacy, and assessment and intervention in
areas including decoding, spelling, reading comprehension, digital literacy and written language.

Prerequis ite: 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-mainstreampopulations within the field of speech-language pathology. Students learn how to select, administer and synthesize results fromvarious as sessment tools (e.g., standardized normedreferenced, criterion-referenced tests, dynamic assessment 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 is sues will be included. Expected preparation: SpHr 488/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; staffseminars in case dis positions.
Maximum: 18 credits. Recommended prerequisite: 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 -Res earch (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 -Elementary Data Analysis (4)

A course in exploration ofdataanalysis and basic statistical topics. May include descriptive statistics, 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 neces sary level on the mathematics placement test with in 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 part of management practice. Content includes statistical analys is, theoretical foundations and tools, as they relate to the application ofstatistics to problem solving in uncertain business environments. Emphasizes application of statistical tools to real world datasets and ability ofstudents to make managerial recommendations.
Prerequisite: Completion of Mth 95 with a grade of C- or above within the last year, or passing at the neces sary level on the mathematics placement test within the last year (see Math Department webpage at mth.pdx.edu for information)..

## Stat 243 - Introduction to Probability and Statistics I(4)

A basic course in statistical analysis including presentation of data, descriptive statistics, probability, probability distributions, sampling distributions, estimation, and use of statistical computer packages. A broad nontechnical survey designed primarily for non-math students who need to utilize the subject in their own fields. Not approved formajor 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 passing at the neces sary level on the mathematics placement test within the last year (see Math Department webpage at mth.pdx.edu for information)..

## Stat 243R-Recitation for Stat 243 (0)

Recitation for Stat 243.
Corequisite: Stat 243.

## Stat 244 - Introduction to Probability and Statistics II (4)

A bas ic 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 ofstatistical computer packages. A broad nontechnical survey designed primarily for non-math students who need to utilize the subject in their own 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 for Stat 244.

Corequisite: Stat 244.
Stat 299-Special Studies (1-4)
(Credit to be arranged.)

## Stat 351 - Probability and Statistics for Electrical and Computer Engineering (4)

An introduction to applied probability, statistics, and data analysis. Sample spaces, probability laws, discrete and continuous probability models, sampling theory, point and intervalestimation, hypothesis testing, regression, correlation, experimental design, analys is of variance, computersimulation and computation in Matlab. Applications to problems of current interest to electrical and computer engineers.
Prerequisite: Mth252..

## Stat 353 - Exploratory Data Analysis and Statistics for Mechanical and Materials Engineering (4)

A statistics course with the main emphasis on understanding data frommechanical engineering applications. Computer-basedmethods 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 RMarkdown to process, manipulate, analyze, and visualize data; as well as to generate reproducible reports froma 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 regression, model diagnosis, 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, analysis of covariance, other designs.
Prerequisite: Stat 244..

## Stat 387 - Introduction to Statistical Learning (4)

Provides an introduction to thetechniques of statistical learning, including assessing model accuracy, linear regression in high dimension, binary and multi-ary classification, re-sampling methods, tree-bas ed methods and neural networks.

Prerequisite: Stat 364.

## Stat 399 -Special Studies (1-6)

(Credit to be arranged.)

## Stat 401 - Res earch (1-6)

(Credit to be arranged.) Consent of ins tructor.

## Stat 404 -Cooperative Education/Internship (1-

 12)(Credit to be arranged.)

## Stat 405 - Reading and Conference (1-8) <br> (Credit to be arranged.) Consent of instructor.

## Stat 407-Seminar (1-4)

(Credit to be arranged.) Consent of ins tructor.

## Stat 409 - Practicum (1-12)

(Credit to be arranged.)

## Stat 410 -Selected Topics (1-8)

(Credit to be arranged.) Consent of ins tructor.

## Stat 451 - Applied Statistics for Engineers and Scientists I(4) <br> Sample spaces, probability, counting measures, dis crete 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 forcredit. . 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 course in a sequence oftwo: 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 forcredit. . 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 sequence of three: Stat 461, Stat 462, and Stat 463 which must be taken in sequence. Expected preparation:MTH 253.
Prerequisite: Mth 254 and Mth 261 or equivalent..

## Stat 462 - Introduction to Mathematical Statistics II (3)

Functions of randomvariables - one dimensional and higher dimensional, sampling distributions, Central Limit Theorem, point and interval estimation. This is the second course in a sequence of 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 hypotheses, analysis 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 Regres sion 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, engineering, and business.

Also offered for graduate-level credit as Stat 564 and may be taken only once forcredit. . Prerequisite: M th 261 and either Stat 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; analysis of variance, checking model adequacy; block designs; Latin squares; factorial designs; fractional factorial des igns. All sections will illus trate real world applications with computer usage. This is the first course in a sequenceof 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 once forcredit. . 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 analys is; analysis of covariance. All sections will illus trate real world applications with computer usage. This is the second course in a sequence oftwo: 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, discrete-time Markov chains, branching processes, Poisson processes. This is the first course in a sequenceof 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 forcredit. . 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, fromwithin 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 (112)
(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 instructor.

## Stat 543 -Survey of Statistical Methods (4)

An introductory, discipline-neutral course in statistical analysis to prepare graduate students for research methods courses in other departments. Topics include descriptive statistics, confidence intervals, hypothesis tests, regression and correlation, analys is of variance, chis quared tests, anduse 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:Mth252.

## Stat 552 - 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 course in a sequence oftwo: 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, random variables 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.

Prerequis ite: 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 distributions, covariance, distributions of sample statistics, and convergence theorems. This is the second course in a sequence ofthree: 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 regression. Computational algorithms and computer software 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; analysis of variance, checking model adequacy; block designs; Latin squares; factorial designs; fractional factorial des igns. Alls sections will illustrate real world applications with computer usage. This is the first course in a sequenceof 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 treatmentof experimental design; fixed and randomeffects models; split-plot designs; nested designs; relation to regression analys is; analysis of covariance. All sections will illustrate real world applications with computer usage. This is the second course in a sequence oftwo: 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)

Bas ic concepts of probability, conditional probability, conditional expectation, discrete-time Markov chains, branching processes, Poisson processes. This is the first course in a sequenceoftwo: Stat 567 and Stat 568 which must be taken in sequence.
Also offered for undergraduate-level credit 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 supervis ed consulting sessions with clients on appropriate projects brought to the Statistics Consulting Laboratory. Data and/or statistical problems, fromwithin 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 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 multivariate statistical analysis. Deals with vectorvalued data generated on individual experimental units. Applies the methods of vector analysis and matrix algebra to statistical problems ofestimation 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 dis tributions. 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)

Res ampling methods in statistics using empirical data, programming with statistical software, review materials (sampling distributions, hypothesis testing, confidence interval construction, and design of experiments), res ampling version ofreview materiak, 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 randoms ampling. Includes stratified, cluster, systematic, and multi-stage 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 statis tics 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 logistic regression will include: parameter interpretation, statistical adjustment, variable selection techniques, and model fit assessment. 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 accommodatecensoring are presented. Parametric models and methods, including accelerated failure time models, the Kaplan-Meier estimate of survival, Cox proportionate hazards model, the extended Coxmodel, 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 analysis of experimental data with minimal model assumptions. 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-statistics, permutation tests, Bootstrap, Monte Carlo power simulation 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 (112)
(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-Pears on construction, likelihood ratio tests, robustanalogues. Recommended prerequisites: Mth 511, 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-Pears on construction, likelihood ratio tests, robustanalogues. Recommended prerequisites: Mth 511, 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-Pears on construction, likelihood ratio tests, robustanalogues. Recommended prerequisites: Mth 511, Stat 563.

## Stat 664 - Theory of Linear Models I (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 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 normaldistribution; 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 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 trade-off, 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 Statistical Learning: 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 StatisticalLearning: 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. Emphas is on listening comprehension, and oral practice, the elements of grammar, vocabulary building, and elementary readings. This is the first course in a
sequence ofthree: Swah 101, Swah 102, and Swah 103.

## Swah 102 - First-Year Swahili Term 2 (4)

Introduction to elementary Swahili. Emphas is 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. Emphas is on listening comprehension, and oral practice, the elements of grammar, vocabulary building, and elementary readings. This is the third course in a sequence ofthree: Swah 101, Swah 102, and Swah 103.

## Swah 201 -Second-Year Swahili 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 Swahili 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 Swahili Term 3 (4)

Intensive review ofbasic 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 clas sroomstudy and community involvement, students obtain knowledge and skills applicable to societal problems. 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: lis tening, 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 sequence of three: Swed 101, Swed 102, and Swed 103.

## Swed 199-Special Studies (1-5)

(Credit to be arranged.)

## Swed 201 -Second-Year $S$ wedish Term 1 (4)

Intensive review ofbasics introduced in first-year courses and further development of communication skills. This is the first course in a sequenceof 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 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: 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 thestudent 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 ofbecoming a professional generalist social worker.

## SW 320U- Introduction to Child Welfare (4)

An overview of the child welfare systems. Introduction to the identification, treatmentof 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 social justice 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 socialwelfare 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: Admission 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 socialwork 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 throughout the lifespan in professional and community settings. Historical and socio-political is sues will be integrated with theory to prepare beginning generalistsocial 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 issues 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 better understand the influence ofs tateand 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 addres sed through the literature and practices of psychology, sociology, medicine, and social work. We will explore the definitions of substance abuseand paths to recovery mediated by the influence of social, cultural, and political forces impacting individuals, families, and communities.

Prerequis ite: 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 developmentofcritical 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 410U- Selected Topics (4)

(Credit to be arranged.)

## SW 416 -Motivational Interviewing (4)

Hands on practice intensive courseteaches the central theoretical and empirical tenets of Motivational Interviewing (MI), as well as the clinical skills neces sary to deliver the intervention to a wide range of clients in diverse settings. Students will learn and practice both thespirit and techniques of motivational interviewing.

Prerequisite: Upper Div is ion 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.

Prerequis ite: Admis sion to the major and SW 351.. Corequisite: SW 400.

## SW 431 -Social Work Practice III (3)

The third course in a four-coursesequence, 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.

Prerequis ite: SW 431.. Corequisite: SW 400.

## SW 441 -Psychobiology for Social Workers (3)

Provides baccalaureate level social workers with a basic understanding of biological concepts, phys iological systems, and neurologicalenvironmental interactions. Enhances social work practice skills by providing a holistic conceptualization of people-in-environment.

Prerequisite: Admis sion to major..

## SW 447 -Social Work andSus tainability (3)

Examines the role of professional 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, cons idered theoretically and practically.
Sustainability linked to attainment of environmental, economic, and socialjustice. Includes communitybased learning projects addressing sustainability.
Also offered for graduate-level credit as SW 547 and may be taken only once for credit.. Prerequis ite: SW 440 (BSW program) orSW 541 (graduate) or their equivalent..

## SW 450 - Social Work Res earch andEvaluation I (3)

The importance of social work research and evaluation for practice and policy. Qualitative and quantitative research, criticalconsumption of research, and conducting evaluations. Focuses on research that promotes social and economic justice and that encourages respect for diversity. Includes experimental designs, single system designs, focus groups, and interviews. Covers early phases of the res earch process: conceptualization, design, sampling, measurement, and data collection. Emphasizes ethical is sues.
Prerequisite: Admis sion to major; SW 351..
SW 451 - Social Work Research and Evaluation II (3)

Teaches next phases of the res earch and evaluation process: data analysis, formulation of implications of findings, and dissemination. Critical consumption of research findings as well as conducting data analysis. Qualitative and quantitative data analysis, including descriptive statistics, hypothesis testing, data analysis of single systemdesigns, 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 is sues applying to work with American Indian and Alaskan native youth. Emphas is is on Indian child welfare is sues 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)

Nine month agency-based 500 hour field placement with a concurrent field seminar. Supervised field placement and weekly field seminar to integrate theory and critical thinking. Apply generalist social work knowledge and skills in real world practice settings. Core component of MSW curriculum. Required three times in generalist year.

## 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 social service agencies in Costa Rica. Course will prepare students to offer social work services in multicultural, multilingual settings through the context of social work values and ethics and with special attention to anti-oppressive and nondiscriminatory practice with diversepopulations.

## SW 515-Skills for the Helping Process - Groups (3)

Help students to developassessment and intervention skills across multiple levels. Assess types and stages of groups, roles, and group dynamics. Developa group proposal. Learn how to begin, facilitate, and end a group with clients, organizations, 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 thespirit and techniques of motivational interviewing.

## SW 517 - Health Across the Lifespan I (3)

This is a three-termadvanced concentration course for students in health related settings. Focus on selfawareness, ethics, chronic disease, teamwork, disparities, health literacy, and use of interpreters. Role of social work across numerous settings explored. Relevant legal reporting, medical terminology and introduction to theory. This is the first course in a sequenceof three:SW 517, SW 518 , SW 519 and must be taken in sequence.
Prerequisite:SW 511 or SW 589.. Corequisite:SW 512.

## SW 518 -Health Across the Lifespan II (3)

Advanced concentration course for students in health related settings. Intervention and assessment modalities and important practice theories. Transitional planning across the continuumof care, health reform, integrated medicine, advance care planning, moral dis tress, critical thinking about medical model and oppression, navigation ofteam dynamics, bias, privilege, pain management. This is the second course in a sequenceofthree: SW 517 , SW 518, SW 519 and must be taken in sequence.

Prerequisite:SW 517.. Corequisite: SW 512.

## SW 519 - Health Across the Lifespan III (3)

Advanced concentration course for students in health related settings. Peer consultation, ethics committees, social determinants of heath, group work, surrogate decision making, harmreduction models, assessment tools, intervention and evaluation of practice, NASW Practice Standards, basic pharmacology, policy related to systems of care. This is the third course in a sequence ofthree:SW 517, SW 518, SW 519 and must be taken in sequence.

Prerequisite:SW 518.. Corequisite: SW 512.

## SW 520 - Social Welfare History and Policy (3)

Addresses the policy making of social welfare and explores values and ethicalchoices 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 antioppressive practice in the micro and mezzo practice arenas, with an emphasis on the micro levels of intervention. The focus is on the positional privilege of social worker and the oppression experiences of service users (clients) and communities.
Prerequisite:SW 539 and SW 532, or SW 589..

## SW 521 - Advanced Anti-Oppressive Practice (3)

This course builds student capacity for antioppressive practice in the micro and mezzo practice arenas, with an emphasis on the micro levels of intervention. The focus is on the positional privilege of social worker and the oppression experiences of service users (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, adverse childhood 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 thehistory 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-establis hed social work method for promoting social change and improving community life through community and institutional reform. Topics forclass 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 communitybased organization, 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 copeand support each other in lowincome urban neighborhoods; examines the ways in which work and welfare interact with each other and with informal social supports. Addresses policy issues, including those involved in both service and income strategies to relieve or prevent poverty; develops skills foreffective practice with low-income 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 in Social 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 tosocial work practice.

## SW 528 - Facilitation of Multi-disciplinary/Care Coordination Team Meetings (3)

Addresses the theoretical foundations, applications and facilitation skills required forcollaborative participatory decision-making in the context ofsocial work practice across populations. Develop framework for facilitating in-depth strengths, needs assessment and problem solving. Gain understanding and skills in balancing power dynamics, clinical perspectives, andtimely decis ion-making 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 fromvarious 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, Assessment 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 assessment 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 criticalevaluation 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.

## SW 533-Clinical Social Work Practice I (3)

This is a three term clinical concentration course that provides advanced theory-based practice from multiple theoretical perspectives. Specialattention will be paid to relational self-awareness, cultural res ponsiveness, ethics, evidenced-based principles and intervention with individuals, families, and groups. This is the first course in a sequence of three: SW 533, SW 534, SW 535 and must be taken in sequence. Co-requisite: SW 512.
Prerequisite: SW 511 or SW 589 (Advanced standing only).. Corequis ite: SW 512.

## SW 534 - Clinical Social Work Practice II (3)

The second in a three-course sequence, course addresses the family of origin perspective on family systems theory. Students deepen self-awareness related to their diversity and positionality in providing clinical services. Understanding and managing one's reactivity in clinical interactions is a focus. Other theories are integrated. This is the second course in a sequence of three: SW 533, SW 534, SW 535 and must be taken in sequence.
Prerequisite:SW 533.. Corequisite: SW 512.

## SW 535 -Clinical Social Work Practice III (3)

This course integrates knowledge fromprevious courses and field practicum. Students are provided an opportunity to develop and articulate their pers onal theoretical orientation or practice model, an es sential step in beginning a career as a professional clinical social worker. Professional is sues and licensing will be addressed. This is the third course in a sequence of three: SW 533, SW 534, SW 535 and must be taken in sequence.
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 cons truction of conceptual frames with social work values andethics are critiqued. Theories addressing the behavior and change in process of communities and organizations are applied and evaluated.

## SW 542 -Social Workin Native American Communities (3)

Introduces and expands social work knowledgeand methods appropriate for working with tribal and urban Indian communities. The historical, 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 informpractice 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 from a lifespan perspective. 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 social cognition and identity development in mid and late adulthood.

## SW 545 -Advanced Human Behavior in the Social Environment (3)

Provides an opportunity forstudents to explore current theoreticaldevelopments in the social and behavioral sciences which apply to social work practice including populations at risk. Taught in different sections each of which covers social and cultural contexts forhuman behavior in the social environment. May be repeated for additional credit.

Also offered as SW 645.. Prerequisite: SW 531, SW 541 or SW 589 (Advanced standing only)..

## SW 547 -Social Work andSustainability (3)

Examines the role of professional social work in achieving sustainability at individual, community, regional, national, and global levels. Using a multidisciplinary perspective, the environmental, economic, and social aspects ofsustainability, cons idered theoretically and practically. Sustainability linked to attainment of environmental, economic, and social justice. Includes communitybased learning projects addressing sustainability.

Also offered for undergraduate-level credit as SW 447 and may be taken only once for credit.. Prerequisite:SW 440 (BSW program) or SW 541 (graduate) or their equivalent..

## SW 548 - Advanced Social Work Practice with

 Latinx (3)Provides a foundation of Latinxsocial work in outpatient mental health and integrated health settings. Examines Latinx cultural diversity, 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 or SW 589.

## SW 549 -Spirituality in Social Work Practice (3)

Explore the spiritual and religious diversity of flients 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 assessments within a wide range of social work practice settings.

## SW 550 - Research and Evaluaton I (3)

Introduction to research and evaluation in social work. Introduces critical consumption of research and ethics. Addresses qualitative and quantitative social work research, group designs, single system designs, and evaluation. Considers measurement, sampling, design, and data collection. Addresses social and economic justice, cultural sensitivity, inclusion, and diversity.

## SW 551 - Research and Evaluation II (3)

Focuses on techniques of quantitative dataanalysis and introduces methods of qualitative dataanalysis. Descriptive statistics, probability theory and hypothesis testing, and inferential methods. Addresses connections between (a) social work
research andevaluation and (b) social and economic justice, cultural sensitivity, inclusion, and diversity.
Prerequisite: SW 550..

## 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 racialdis parities in a wide array ofhuman service systems. The course focuses on building individual, org anizational and leadership efficacy for advancing racialequity.
Prerequisite:SW 550 and SW 551, or SW 513.

## SW 555 - Social Work Perspectives on Mental Health Dis orders (3)

Reviews and analyzes mental disorders fromDSM-5 perspectives and variables thatres hape and redefine concepts and definitions ofmental health and illness. The development, use, influence, and limitations of DSM are cons idered fromvarious contexts.
Examines strategic approaches to assessment, diagnosis, and intervention from the recovery philosophy and SW perspectives.

Prerequisite:SW 530 or SW 589..

## SW 556 - Advanced Clinical Practice in Integrated Health Care (3)

Introduction to the direct practiceof integrated health in primary care. Students will become knowledgeable of the roles of health providers working in primary care settings, theories and models of care, engagement, as sessment, intervention, practice evaluation, and cross-cultural is sues.

Prerequisite: SW 530, SW 531 and SW 551, or SW 589.

## SW 557 -Supervision in Social Work Practice (3)

Explores the knowledge and skills for effective social work supervision, emphasizing a collaborative, developmental, reflective and competency-based approach. Attention is paid to the cross cultural, sociopolitical, and ethical influences on supervision 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 biops ychosocial intervention model for working with
individuals, groups, and families will be explored through multiple theoretical lens.

Prerequisite: SW 530 or SW 589.

## SW 559 - Community and Organization Res earch

 (3)Prepares for mezzo and macro research practices to create the evidence base for social change (building the research base to advance reforms ), strengthening organizations (designing and using program evaluation to improve programs and organizations), and building the voice and influenceof marginalized communities (includinglocal and regional communities and organizational service users).
Prerequisite: SW 550 and SW 551, or SW 513.

## 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 socialenvironments, 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 practiceof 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 their effect 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, res earch, 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 dis counted or devalued through dominant discourses are brought to light.

Prerequisite: SW 530 or SW 589.

## SW 563 -Social Work with Children, Adolescents, and Their Families (3)

Explores clinical socialwork practice with children, adolescents, and families. Emphasizes a collaborative
and contextual approach that, in addition to childfocused 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 or SW 589..

## SW 564 - Social Work in Schools (3)

Uses a policy/practice perspective 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 Dis ability Studies in Practice (3)

Emphasizes deepening understanding of lived experiences of individuals with disability in the context of larger societal and community structures. Students will examine participation, community, health, mental health, education, academia, pers onal as sis tance services, violence, hate crime, and employment through critical disabilities 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, professional, and personal lives.

## 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 is sues 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 mentalhealth populations. These interventions include supported employment, as sertive community treatment/case management, psychosocial rehabilitation, psychopharmacology, recovery and consumer perspectives, and integrated treatment for co-occurring substance use disorders.

Theoretical frameworks include harmreduction, transtheoretical/readiness to change, and health promotion.

Prerequisite: SW 531, SW 532, or SW 589 (Advanced standing only)..

## 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 persis tent 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 for credit.

## 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 dimens ions at end-of-life, pain and symptommanagement, hospice, ethical considerations, practice and policy guidelines, team work, 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 cris is intervention. Students will also gain knowledge and skills in anti-oppressive, culturally responsive practice.

Prerequisite: SW 530 or SW 589. Corequisite:NA.

## SW 571 - Subs tance 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. Assiststudents 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 emphasis on age appropriate assessment. Psychosocial interventions forboth community and institutionalized populations will include individual, family, group, and environmental approaches.

## 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 culturallyres ponsive services based on assessment, en gagement and intervention and the liberation health SW model.

Prerequisite: SW 539 and SW 530, 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 socio-economic 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 is sues confronting the juvenile justice system; and current policy and practice trends toward incarceration and away from rehabilitation.

Also offered as SW 678 and may be taken only once for credit. . Prerequisite: SW 520 orSW 589 (Advanced standing only)..

## SW 579 - Engaging with the Mandated Client (3)

Course examines legal, ethical and effective practice with involuntary clients, often members ofoppressed groups. Will also address research regarding
"involuntary practitioners," self-care, client advocacy, value conflicts, and reformefforts.

## SW 583 -Empowerment Approaches with Transition-Age 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)introducetheories, interventions, research, and complex is sues associated with intimate partner violence (IPV). Students will be asked to explore the intersections ofmicro and macro violence to better understand the influenceof state and structural violence on the lives of individuals and communities, particularly those fromracialized groups.

## SW 585 - Fund Development and Grant Writing

 (3)Deepening understanding of funding role and development in nonprofit industry. Application of fundrais ing strategies and grant writing to create or recreate innovative programs and marketing strategies. Develop program budgeting, accurate case statements and mes sages, draft grant applications and learn to create and sustain authentic long termfund developmentstrategies.

## SW 586 - Children, Youth and Families I (3)

Advanced concentration course for students working with children, youth, and families. Focus on ethics, self-reflection and identity, and social location, critical analysis, and multi-disciplinary system work. Theories and frameworks for multidimensional assessments are examined. This is the first course in a sequence of three: SW 586, SW 587, SW 588 and must be taken in sequence. Co-requisite: SW 512.

Prerequisite: SW 511 or SW 589.. Corequisite: SW 512.

## SW 587 - Children, Youth, and Families II (3)

Advanced concentration course for students interested in working with children, youth, and families. Student will continue to explore, learn, and apply methods for multi-sys temic social work practice. Demonstration of practice methods and skills for working though barriers created by social policies that impact children, youth, and families will be addressed. This is the second course in a sequence of three: SW 586, SW 587, SW 588 and must be taken in sequence.

Prerequisite:SW 586.. Corequisite: SW 512.

## SW 588 - Children, youth, and families III (3)

Third advanced concentration course for students interested in working with children, youth, and families. The course requires a deepening of practice skills. Students address secondary traumatization, burnout, and self-care. Also will examine impact of policy on service-users and promoting serviceuser influence on policy. This is the third course in a sequence of three: SW 586, SW 587, SW 588 and must be taken in sequence.
Prerequisite: SW 587. Corequisite: SW 512.

## SW 589 - Advanced Standing Seminar (4)

Students who successfully complete this seminar will demonstrate the competencies to enter the advanced year of the MSW program. This seminar will provide a connection between the BSW curriculumand advanced MSW curriculum, and evaluate students' readiness for advanced practice. The course requires students to demonstrate foundational social work skills, critical self-reflection, and academic readiness for graduate course work.
Prerequis ite: Admis sion to advanced standing program.

## SW 590 - Advanced Topics in Applied Research Methods for Social Work (3)

Builds on foundation research methods and data analys is courses. Courses offered under this number present an evidence-based framework for social work practice and methods for analyzing quantitative data (e.g., multiple linear regression) 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 551 or SW 589 (Advanced standing only)..

## SW 591 - Child \& Adoles cent 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 ecological-developmental framework and culturally sens itive 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 knowledge of behavior and development.

Prerequisite: SW 531 or SW 589.

## SW 593 - Practice and Leaders hip with Communities and Organizations I(3)

This course anchors the three-quarter advanced concentration for social work practice and leadership in community and organizational contexts, advancing skills in empowering individuals, organizations and communities for just solutions to social problems. This is the first course in a sequence of three: SW 593, SW 594, SW 595 and must be taken in sequence. Co-requisite: SW 512.

Prerequisite: SW 511 or SW 589.. Corequisite: SW 512.

SW 594 - Practice and Leaders hip with Communities and Organizations II (3)
The second course of a three-termsequence is focused on group work, organizational and community assessments. This course is designed to look at features of organizational and community action planning including building coalitions, with emphasis on popular education, increasing equity, and reducing disparities. This is the second course in a sequence of three: SW 593, SW 594, SW 595 and must be taken in sequence. Co-requisite: SW 512.
Prerequisite:SW 593.. Corequisite: SW 512.

## SW 595 - Practice and Leadership with

 Communities and Organizations III (3)In the third termof this course sequence involves building student skills in social transformation, at both the organizational and community level, with heightened focus on improving public policy. Students will build skills for practicing policy advocacy frominside and outside the system. This is the third course in a sequence of three: SW 593, SW 594, SW 595 and must be taken in sequence. Corequisite: SW 512.
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 -Selected Topics (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, historical, 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 multilevel intervention plan based on review of empirical literature. Programtheory and theories of change will be explored. Analysis 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 lowincome urban neighborhoods; examines the ways in which work and welfare interact with each other and with informal socialsupports. Addresses policy is sues, including those involved in both service and income strategies to relieve or prevent poverty;
develops skills foreffective practice with low-income 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 effectivecurriculum and instruction across settings: clas srooms, community contexts, and res earch 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 for credit.

Prerequisite:Doctoral studentstatus 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 fromvarious 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 philos ophies of science and the implications for scientific practices and other means of generating knowledge. The course will advance students' 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 in Social 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 quasi-experimental 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 anduse 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 froma 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 themicro, mezzo and macro levels, specifically: individual lived experiences, society and culture, and language and communication. In order to covereach of theselevels of analysis, the course will address at least one research methodology in each of the three levels. These are hermeneutic phenomenology, life history research, critical ethnography, and critical discourse analysis.
Prerequisite:SW 630..

## SW 634-Quantitative Data Analysis in Social Work Res earch 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 measurement 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 Res earch (3)

The second course of a required three-term sequence. Data collection methods with a specialemphasis 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 coursereviews epistemologies informing qualitative research. The coursealso explores commonly used methods including field notes, interviews, focus groups, case studies, observational methods, and open-ended surveys. Introduction to various analysis and writing strategies will be explored. This is the same courseas 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 practicum enables 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 from a 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 social cognition and identity development in mid and late adulthood.

## SW 645 - Advanced Human Behavior in the Social Environment (3)

Provides an opportunity for students to explore current theoretical developments in the social and behavioral sciences which apply to social work practice including populations at risk. Taught in different sections each of which covers social and cultural contexts for human behavior in the social environment. May be repeated for additional credit.
Also offered as SW 545. . Prerequisite: SW 531, SW 541 or SW 589 (Advanced standing only)..

SW 650 - His tory of Social Work Profession/al (3)
His tory of the profession of social work through a social justice lens. The role ofgovernment, economics, historical figures, and culture in shaping social work profession. Critical theories will guide the exploration of social work's mission, his tory,
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 research. Group members may work together on research projects as well as use the group to consult about independentres earch projects. Expected themes include res earch design is sues, 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)

Dis cusses 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 aspects of applied research, including methodological is sues, cultural competency, consumer involvement, and interd is ciplinary collaboration. May be repeated for additional credit.

## SW 661 - Ph.D. Seminar - Second Year (1)

The Ph.D. Seminar-Second Year is a three-term sequence designed to provide a forum for students to continue professional exploration, and learn how to navigate finding and securing employment opportunities both within and outside academia. Students als o spend this time learning how to progress successfully through major miles tones postcours ework, including comprehensive examination and dissertation.

Prerequisite: SW 660..

## SW 678 - Social Work in the Juvenile and Criminal Justice Systems (3)

Analyzes current controversies concerning the origin and meaning ofcriminal and delinquent behavior; the socio-economic 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 is sues confronting the juvenile justice system; and current policy and practicetrends toward incarceration and away from rehabilitation.

Also offered as SW 578 and may be taken only once for credit. . Prerequisite: SW 520 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 workshops. Salient theoretical and practical is sues in adult learning are explored. Discusses curriculum planning and is sues around human diversity 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 Profes sional 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 ofdis ciplines 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-Based

 Modeling (4)At the crossroads ofbiology, ecology, economics, philosophy, and artificial intelligence, this course introduces Agent-Based Modeling: a new computerbased approach that's grounded in the perspective that the complexmacro-level patterns we observe in social systems are emergent from decentralized and self-organizing micro-level interaction among agents following simple and localized rules.

## SySc 334U-Modeling Social-Ecological Systems (4)

Understanding social and ecologicalcycles 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 socialecological systems.

## SySc 336U-Networks and Society (4)

Introduces the new science of networks and its role in modeling the inherently complexproblems of an interconnected, global society. Simulations explore the evolution of hierarchical, small-world and scalefree network structures and their dynamic behaviors. Implications for information democracy, cyberterrorism, 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 interd is ciplinary course that explores the heuristics through which individuals, groups and communities make their decis ions 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 from rationalbehavior.

## 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 complexsocial problems like poverty, homelessness, and climate change so hard to solve? How can we identify effective leverage points for change? This interdisciplinary 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 organize thems elves to produce complex behavior, 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 346 U ; 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. Dialogue-oriented format and small group exercis es promote a cooperative, student-driven learning environment. Course work calls uponstudents 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) <br> (Credit to be arranged.)

## SySc 411 -Sys tems 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 analys is, 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 346U or any course labeled SYSC 3XXU orSYSC 4XXU..

## SySc 413 - Holistic Strategies for Problem Solving (4)

This course focuses on the application of Sys tems 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 organizations, frameworks/processes for problem-solving, and use of tools like graphic representations and causal-loop 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 cours e or permission of instructor..

## SySc 414 -SystemDynamics (4)

Introduces concepts and methodology to analyze dynamic behavior of systems with complex feedback 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.

Als o offered for graduate-level credit as SySc 514 and may be taken only once for credit.. Prerequisite: Upper-divis ion 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 ins ights into business or career situations where the usual methods are lacking. Specifically, to develop qualitative skills: sys temarchetypes, 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 for credit.. 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 res ilience 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 SySc 518 and may be taken only once for credit.. Prerequisite: Upper-divis ion standing and either CS 346U or any course labeled SySc 3xxU or SySc 4xx.

## SySc 421 -Sys tems Philosophy (4)

A study of ideas central to systems 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 these systems 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 graduate-level credit as SySc 521 and may be taken only once for credit.. Prerequisite: upper-division standing and/or admis sion to the Honors College or one SySc cluster course..
SySc 423 -Sys tems Ideas and Sustainability: Limits, Structural Change, and Resilience (4)

This course offers a systems-theoretic perspective on sustainability. Us ing graph theory, non-linear dynamics, game/decision theory, thermodynamics, and theories of complexity and complexadaptive 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 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 cluster courses..

## 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 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 graduate-level credit as SySc 531 and may be taken only once for credit.. Prerequisite: upper-division standing and completion of one of the SySc cluster courses..

## SySc 435-Modeling \& Simulation with $R$ and Python (4)

Computer modeling \& simulation using general purpose tools, R and Python. Covers statistical and s imulation-based approaches for simulating dynamics, Monte Carlo 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 once for credit. . Prerequis ite: 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 classical topics: random graphs, 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 helpfulthough 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. Emphasis is on game-theoretic models, particularly of dilemmas of collective action, their possible solutions, and theirapplications to social, economic, and political phenomena. Also covered are social choice 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 once for credit..

## 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 analys is, optimization, and game theory.
Also offered for undergraduate-level credit as Sy Sc 411 and may be taken only once for credit.. Prerequisite: graduatestanding, calculus, probability, computer programming..

## SySc 513-Holistic Strategies for Problem Solving

 (4)This course focuses on the application ofSystems 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 organizations, frameworks/processes for problem-solving, and use of tools like graphic representations and causal-loop diagramming.
Also offered for undergraduate-level credit as SySc 413 and may be taken only once for credit.. Prerequisite:upper-division standing and completion of one SySc cluster course orpermis sion of instructor..

## SySc 514 -SystemDynamics (4)

Introduces concepts and methodology to analyze dynamic behavior of systems with complex feedback 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-level credit 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 careersituations where the usual methods are lacking. Specifically, to develop qualitative skills:systemarchetypes, leverage points, strategic behavior and game theory, ecosystems andevolution, and networks; and to gain high-level working knowledge of systemmodeling and simulation.

Also offered for undergraduate-level credit as SySc 416 and may be taken only once for credit.. Prerequisite:upper-division standing..

## SySc 518 -SystemSustainability and Organizational Resilience (4)

Organizations are complexadaptivesystems 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 undergraduate-level credit as SySc 418 and may be taken only once for credit..

## SySc 521 -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 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:upper-division standing and/or admission to the Honors College or one SySc cluster course..

## SySc 523 -Sys tems Ideas and Sus tainability: Limits, Structural Change, and Resilience (4)

This course offers a systems-theoretic perspective on sustainability. Using graph theory, non-linear dynamics, game/decision theory, thermodynamics, and theories of complexity and complexadaptive 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:upper-division standing and completion of one of the SySc 300-level cluster courses..

## SySc 525 -Agent Bas edSimulation (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 notreadily apparent froman examination of the rules that generated the behavior. Such behavior is often referred to as emergent, with examples including flocks ofbirds, 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 socialsystems, but may be used to study a variety of natural and nonnatural systems.

Also offered as SySc 625 and may be taken only once for credit..

## SySc 527 - Discrete System Simulation (4)

The primary focus is on the application of discrete systemsimulation to real world problems using the Arena simulation language. The mathematical basis for discrete systemsimulation is probability theory and queuing theory. It is used extensively in the fields of operations research, civil engineering, and industrial engineering. 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 consentofthe 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 theirown data to discover complex and nonlinear interactions. Thesemethods are implemented in OCCAM, software developed at PSU, the main analytical tool used in the course.

Also offered for undergraduate-level credit as SySc 431 and may be taken only once for credit..
Prerequisite: upper-division 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 simulation-based 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-level credit 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, complexsystems research, andsocial psychological concepts. In depthexposure to foundations of network science, including classical topics: random graphs, 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 undergraduate-level credit as SySc 440 and may be taken only once for credit. . Prerequisite: 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 data management 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 analysis and as a general framework for the study of structure and organization. The course examines the use ofset- and information-theoretic techniques forthe 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.
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, theirpossible solutions, and their applications to social, economic, and political phenomena. Also 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, materialityindependentaspects oflife, its purpose is two-fold: to understand bio logical 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 dynamicalmodels),(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 from neurobiology and on notion of "learning." A variety of NN architectures and associated computational algorithms for accomplishing the learning are studied. Experiments with various available architectures are performed via a simulation package. Students do a major project on the simulatoror 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 notreadily 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 nonnatural systems.
Also offered as SySc 525 and may be taken only once for credit..

## SySc 627 -Discrete System Simulation (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 discrete systemsimulation is probability theory and queuing theory. It is used extensively 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.. Prerequisite: 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 analysis and as a general framework for the study of structure and organization. The course examines the use ofset-and information-theoretic techniques forthe 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.

Also offered as SySc 551 and may be taken only once for credit..

## SySc 657 - Artificial Life (4)

Artificial life (ALife) encompasses mathematical and computational studies ofphenomena 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, materialityindependent aspects of life, its purpose is two-fold: to understand biological phenomena and to develop computational technologies. ALife bears significantly also on the socials sciences and philosophy. It is part of the research programinto "complexadaptive systems". Emphasizes (1) cellular automata (and other discrete dynamicalmodels), (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 557 and may be taken only once for credit.. Prerequisite: 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.)

## SysE510-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 form of hierarchy. The design for supportability/serviceability, the production and effective distribution for customer use, and the sustaining maintenance will be addressed on a total systemlife-cycle basis, with particular emphasis 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 -Sys tems 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 technicalreviews. Expected preparation: SysE591.

## SysE573-Requirements Engineering (4)

Students gain knowledge to translate needs and priorities into systemrequirements that are the starting point for the engineering of complex hardware/software systems. Topics include: larger context in which requirements for a systemare developed; developing mission needs or market opportunities first versus assessing available technology first; translating needs and priorities into an operational concept and then into specific functional and performance requirements; assessment of requirements, including such as pects as correctness, completeness, consistency, measurability, testability and clarity of documentation; relationship between interface definitions and requirements; risk management of requirement is sues, and stakeholders input to increase the prospects for project success. Case studies will be used, many provided by students and involving software-intensive systems. Recommended prerequisite: 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 undesired event. Begins with an overview of the risk management (identify ing, assessing, monitoring, and mitigating) and decis ion process. Differences between mission critical and non-mission critical programmatic riskemphasized. Other topics include the limits of expected value-based risk analysis, decision making strategies such as max/min, $\mathrm{min} / \mathrm{max}$ and regrets. Formalmethods in risk analys is, elementary decision analysis and decision trees, multi-objective decision making, pareto techniques, optimality, and trade-off analysis will be covered. Risk and decision techniques will be contrasted with the interfacing processes of program management and software engineering, fromboth the government and industrial perspectives.

Prerequisite: experience with systems engineering process..

## Sys E 590 - Integrative Workshop(0-4)

Systems engineering is an acquired behavior to be developed throughout the master's degree program. Students and faculty advisers will engage in creative workshop activities integrating technicals pecialty skills and project experience invoking systems engineering applications of communication, synthesis and creativity, teambuilding, problemsolving, management oftime and resources, and systemlifecycle 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 - Sys tems Engineering Approach (4)

Engineering of complexhardware, software systems encompasses quantitative methods to understand vague problemstatements, determine what a proposed product/systemmust do (functionality), generatemeasurable requirements, decide how to select the mostappropriate solution design, integrate the hardware and software subsystems, and test the finished product to verify it satis fies the documented requirements. Additional topics that span the entire product life cycle include interfacemanagementand control, risk management, tailoring of process to meet organizational and project environments, configuration management, test strategies, and tradeoff studies.

Prerequisite: consent of instructor..

## SysE 595-Hardware-Software Integration (4)

Systems engineering is applied to the integration of hardware-software systems, focusing on embedded computer products development and information technology systems. Factors that affect the selection of hardware and softwaresolutions in design will be examined, as well as the use of trade studies to optimize the efficiency of integration issues.
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 his tory 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 voice exercises 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 - S tagecraft 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 equipment and its installation for production will be covered. This course requires a two-hour 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 emphas is on analysis, research, and theexploration of design ideas. Bas ic 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 ofskills 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 bas ic principles and techniques of voice production specifically forstage performance including physiology, breath support and resonance, articulation and projection.

## TA 145 - Acting Workshop(1-4)

Rehearsal, performance, and analysis ofscenes 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 theaterhistory, 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 analysis of representative plays selected from major periods. Emphas is on the production implications 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 works hops as sume familiarity with the shop(s); a higher level of responsibility will be expected.

Prerequisite:TA 134..

## TA 241 - Improvis ational 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 neces sary for improvis ational acting and development 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 - Improvis ational 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 neces sary for improvis ational acting and development ofmaterial 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 ons tage, and collaboration. This course is rigorous and demands outside time commitment for rehearsal.

Prerequisite: TA major; sophomore standing..

## TA 252 - Stage Makeup (2)

A study of the basic principles of the art and technique of makeup forstage and screen.

## TA 253 - WorkshopTheater I- (1-3)

Training in theater production through the intensive study and rehearsal ofscenes 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 ofvisual arts principles as related to scenic design. Projects in stage geography, design composition, and visual imagery are used to develop the student'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 nonmajors 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 responsibilities on productions building on their experiences fromthe 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 aspects of stagecraft, including drafting and drawing for the scene shop, the organization and planning ofscenery construction within a production calendar, and problemsolving 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 ofdress in Western civilization from ancient Egyptian to modern times with emphasis on aesthetic, cultural, and political expressions of clothing. Course may be taken out of sequence.

Prerequisite: Upper-division standing.. Cross-Listed as: This is the same course as Art 322 U and may be taken only once for credit..

## TA 323U- History of Dress II (4)

Historical survey of dress in Western civilization from ancient Egyptian to modern times with emphas is on aesthetic, cultural, and political expressions 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 decorativetechniques, 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 mainstream of the modern theater.

## TA 333 - WorkshopTheater: Directing/Stage Management/Dramaturgy (1-2)

For the Schoolof Music and Theater productions. Offerings include stage manager, assistant 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 outsideofLH 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 - WorkshopTheater: 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 dependupon the assignmentregistered for, but usually include daytime, evening, and/or weekends. Technical rehearsal formainstage productions require a full weekend technical schedule. Course is repeatable for credit.

## TA 335-WorkshopTheater: Management/Publicity (1)

ForPSU Theater Department productions. Offerings include housemanagement, public relations, audience development, publications, educational outreach, and display. This course meets eachterm for one hour per week as a group, with the remaining meeting times depending upon the specific as signments for the termin question. Meeting times depend upon the assignmentregistered for, butmay 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 thatignite thetext. 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 clas s moves the actor further into technique. Language and epic style is a major focus of the work, with emphas is on such writers as Shakes peare, Moliere, Behn, andFord. Class demands commitment to intensescene work outside the classroom.

Prerequisite:TA major; TA 248 and TA 340, and permission 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 complextexts. Must be taken in sequence.
Prerequisite: TA major, TA 341, and permis sion 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 stageenvironments, 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 ofbas ic American, English, and European dialects.

## TA 347 - Mainstage Production (1-4)

Through rehearsaland the stage production, students are challenged to pursue a commitment to individual excellence and collaboration, discover 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. Special emphas is 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 but each termmay be taken separately.
Prerequisite: upper-division standing..

## TA 364 - Development of Dramatic Art II (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 second course in a sequence oftwo: TA 363, TA 364; the course is chronological in its presentation but eachtermmay 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 culturalcontexts 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/Interns hip (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. Emphas is is placed on the design of costumes for
specific plays, using a variety ofstyles and rendering media. Recommended:TA 325.

Prerequisite:TA 321..
TA 430 - Scene Design 2 (4)
Advanced course in scene design for the theater. Emphas 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 non-majors 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. Extensive training in two essential programs: Vectorworks ${ }^{\mathrm{TM}}$ and Lightwright ${ }^{\mathrm{TM}}$.
Prerequisite:TA 314. Open to non-majors with instructorconsent..
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 forgraduate-level credit as TA 540.. Prerequisite:TA major; TA 342, by audition/interview and permis sion of ins structor..

## TA 454 - Directing I(4)

Study and practice in play analysis and directing of scenes. Expected preparation:TA 311, TA 321.
Also offered forgraduate-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 forgraduate-level credit 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 forgraduate-level credit as TA 560 and may be taken only once for credit.. Prerequisite: TA 455 orequivalent experience..

## TA 466W - Development of Dramatic Literature (3)

A survey ofdramatic 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 termmay be taken separately.

## TA 467 - Modern Theater I (4)

A consideration of theater and drama from the late 19th and early 20th century to the present.
Representative plays chosen fromcontinental 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 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.. Prerequis ite: upper-division standing..

## TA 468 - Modern Theater II (4)

A consideration of theater and drama from the late 19th and early 20th century to the present. Representativeplays chosen fromcontinental European, English, Irish, and American repertories. Examination of key directors and trends in staging. This is the second course in a sequenceoftwo: 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 forcredit.. Prerequis ite: upper-division standing..

TA 471 - Theater History: Periods and Topics (14)

Concentrated study of a particular period and/or topic in theaterhistory: 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 appropriates ophomore 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 analysis 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 Playwriting and Women, 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 historical survey of period decor focusing on furniture and interior architectural detail from Egyptian to modern times with emphasis on periods most commonly 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 env ironments, all leading to a public performance. May be repeated for a total of 12 credit hours.
Also offered for undergraduate-level credit 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 analysis and directing of scenes.

Also offered for undergraduate-level credit as TA 454 and may be taken only once for credit..

## TA 555 - Directing II (4)

Advanced practice in analysis and directing of plays for public performance.
Also offered for undergraduate-level credit 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 equivalent experience..

## TA 567 - Modern Theater I (4)

A consideration of theater and drama from the late 19th and early 20th century to the present. Representativeplays chosen fromcontinental European, English, Irish, and American repertories. Examination of key directors and trends in staging. This is the first course in a sequence oftwo: TA 567 and TA 568. Cours es may be taken outof sequence.
Also offered for undergraduate-level credit as TA 467 and may be taken only once for credit.. Prerequisite: upper-division standing..

## TA 568 - Modern Theater II (4)

A consideration of theater and drama from the late 19th and early 20th century to the present.
Representativeplays chosen fromcontinental European, English, Irish, and American repertories. Examination of key directors and trends in staging. This is the second course in a sequenceoftwo: 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:upper-division standing..

## TA 571 - Theater History: Periods and Topics (14)

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, Stanis lavsky, Appia, Brecht, and Artaud.
Also offered for undergraduate-level credit as TA 472.. Prerequis ite: upper-division standing..

## TA 574 - Dramatic Writing I (4)

A sequence in scriptwriting involving analysis 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 oftwo: 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 themthis year.

## Tur 101 -First-Year Turkish Term 1 (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 Term 1 (4)

Intense review 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 Tur203. Expected preparation: Tur 103.

## Tur 202 -Second-Year Turkish Term2 (4)

Intense review 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 sequenceof three: Tur

201, Tur 202, and Tur 203. Expected preparation: Tur 103.

## Tur 203 -Second-Year Turkish Term3 (4)

Intense review 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: Tur 203.

## 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 341 U- 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 dis cussion 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 - Res earch (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 410U-SelectedTopics (4)

(Credit to be arranged.)

## Tur 416 - Readings in Turkish (2)

A variable-content course designed to giveadvanced students of Turkish experience reading in a variety of content areas. To be taken in conjunction with regularly scheduled co-requisite courses. Students taking a co-requis ite course will do part of the required reading for that course in Turkish. Expected preparation: Tur 341.

## ULib - Library Rese arch

## Ulib 101 - Library Research Skills (2)

Introduces library research skills with a focus on information use in the digitalenvironment. Topics include finding, evaluating, and using information ethically. Emphasizes res earch skills needed for undergraduate research assignments.

## ULIB 510 -Special Topics (1-9)

(Credit to be arranged.)

## UnSt - University Studies <br> UnSt 170 - Multilingual FRINQ/SINQ Lab (1-2)

Multilingual residentand 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 responsive 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 for creating greater academic, professional, and personal success. Students will understand self-empowerment, personal responsibility, self-motivation, interdependence, selfawareness 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 them in choosing a major or career.

## UnSt 196 -S ummer Bridge Program (3)

The Summer Bridge Programis a TRiO/Student Support Services (SSS) joint partnership with PSU. Students will strengthen anduse the academic skills needed for success at the University. Students will become familiar with the campus and visit clas ses 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 program for new freshmen at PSU des igned 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 298 - Roads to Success Fall Seminar (1)

Roads to Success fall seminar is a co-requisite to Roads to Success Intersession and continues the curriculum from the two-week course. Students are exposed to criticalstudy 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, class, 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 careeropportunities or graduate and/or professional programs. By providing assistance with these processes, we hopeour students will experience success in their various endeavors aftergraduation.

## UnSt 390 - TRiO Student Support Services Transfer Student Bridge Program (2)

Introduction to personnel, res ources, and systems at PSU. Through clas sroom activities, discussions, group work, and presentations, the class aims to give trans ferstudents a solid foundation for understanding how to successfully navigate their experience at PSU and get the mostout of their education.

Prerequisite: Admission 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 responsibility, self-motivation, interdependence, selfawareness and other critical components of keeping themon course to their goals.

## UnSt 399 - Special Studies (1-8)

(Credit to be arranged.)

## UnSt 401 - Res earch (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 - Caps tone (1-6)

The culmination of the University Studies program is the Capstone course requirement. This 6 -credit, community-based learning course is designed to provide students with the opportunity to apply, in a team context, what they havelearned in the major and in theirother 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 fromone's own. Independent volunteering, work experience, by arrangement credits, internships and practicacannot fulfill the Caps tone requirement. Students must have completed 90 credit hours before registering for their 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, resources, and skills to become effective peermentors.

## 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 communicationskills, 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 careerrelated resources in urban and public affairs, allow forskill building and professional networking. Students will gain a betterunderstanding of what career options would be a good fit for themand ways to use their educational experience forprofessional 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 - Res earch (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 substantiveopportunities 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.
Prerequis ite: Senior standing..

## USP - Urban Studies \& Planning

## USP 199 -Special Studies (1-4)

(Credit to be arranged.)

## USP 233 -Real Estate Principles (3)

Surveys the legal, physical, and economic structure of the real estate market and the characteristics of real estate resources. Develops basic real estate valuation procedures and provides an overview of market analys is 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 interdisciplinary 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-first century. 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 interdisciplinary 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-first century. Cities as economic, social, and political systems and ways in which people have thought about cities.

## USP 301U- Introduction to Community Development (4)

An investigation of concepts, models and perspectives of community development practice. Explores social, cultural, religious, political economic 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 from the field and requires substantial reading reflection and discussion.

## USP 302 - Theory and Philos ophy 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: upperdivision standing.

## USP 312 U- Urban Housing and Development (4)

Problems ofhousing, development, and redevelopment in an urban setting are analyzed from economic, demographic, and planning perspectives. Introduction to the nature of the urban economy and residential location, with a focus on housing problems and their associated social, physical, and racial aspects. Role offederal and community-based hous ing policies and programs. Recommended prerequisite: USP 311 .

## USP 313 U- Urban Environmental Issues (4)

Environmental issues 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 attemptto achieve balance between social, economic, and ecological factors is addressed in the context of urban environmental policy, planning and community activism.

## USP 314U- The City in Film (4)

Critically examines urban social is sues reflected in films from different countries. Course includes inclass screening, lecture and discussion, and film review writing exercises. Topics for discussion include the urban form, is sues of race, gender and social class, therelationships among communities, political authority, industry, commerce, police, street gangs, criminals, public schools, and other institutions and denizens of the city. The course provides linkages to other courses in USP's undergraduate community development major and to issues related to urban studies.

## USP 316-Community Organizing and Social Change (4)

Community organizing seeks to involve people in collective action to address issues of social change and socialjustice. This coursecovers the history, philosophy and goals of community org anizing 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 investigation of concepts, models, and perspectives of International Community Development practice. Explores social, cultural, religious, political, economic, and environmental aspects 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

Examines urban realestate development, including location of activities within metropolitan areas, public/private partnerships, downtown redevelopment, and affordable housing. Presents tools to evaluate 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 issues at the intersection of urban policy and planning and individual and community health. Relationships between the ways in which land is used, the transportation 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 aspects 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 formand social patterns, and efforts by urban designers to influence community life by shaping the built environment. The history of ideas about urban form and community development, and the his tory of proposed and implemented projects will be surveyed, and their relevance for contemporary urban planning and design practices will be assessed. Initiatives in the Portland metropolitan area to enhance community livability will be studied.

## USP 326U- Neighborhood Conservation and Change (4)

The dynamics of neighborhood development, including economic and institutional factors in neighborhood change; neighborhood definition and image, res idential 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 historicalcontext with an assessment of its impact to date. Participation from the perspective of both the public and the government will be covered as will the variety of approaches for achieving participation goals and objectives.

## USP 360 - Real Estate Finance I (4)

Application of finance and economic principles to analys is of real estate finance and investments. Emphasis on the development of problemsolving capabilities through the useofcomputer application programs. Special attention is given to risk analysis, alternative mortgage instruments, hedging techniques, and the taxeffects of realestate investment.

Prerequisite:Ec 201. . Cross-Listed as:The course is cross listed as RE360, and may only be taken once for credit..

## USP 385U - His tory 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 res idents. 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 development 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 from political, social, economic, and cultural perspectives.

## USP 399 -Special Studies (1-6)

(Credit to be arranged.)

## USP 401 - Res earch (0-6)

(Credit to be arranged.) Consent of instructor.

## USP 485-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 reg arding how older adults use, perceive, and are affected by their homes and environments. Topics include housing options, accessible 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 once forcredit.. Prerequisite: Upper-divis ion standing..

## 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 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 instructor.

## USP 410-Selected Topics (1-6)

(Credit to be arranged.)

## USP 410U-Selected Topics (1-4)

(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 pasttwo years.
Also offered for graduate-level credit as USP 511 and may be taken only once for credit.. Prerequisite: 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 includehistory 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: upperdivision or graduate-level standing.

## USP 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 USP 514 and may be taken only once forcredit.. 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 worldwide.
Also offered for graduate-level credit as USP 516.. Prerequisite: Upper-divisionstanding..
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 and ethnicity, 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.. Cross-Listed as: Soc 441.

## USP 427-Commercial District Revitalization (3)

Examines the evolution and revitalization of commercial districts overtime. It explores the role of commercial districts in contemporary urban regions, and introduces the concepts of commerciald is trict management and otherstrategies for promoting vital urban centers. Through readings, field observations, classroomdiscussions, and a series of assignments, 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 graduate-level credit as USP 527 and may be taken only once forcredit.. 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 communitybased 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 res earch project which examines cas es 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 forcredit.. 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 historical 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 Res earch Methods for Community Development (4)

This course introduces students to participatory methods, placing special emphasis on research ethics, the positionality of the res earcher, and embedding research within community development practice. It focuses on research design, data collection, data analys is, and the dis semination of results. Various approaches to measuring urban phenomena are 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 landuse, environmental quality, transportation, housing, income distribution, and financing of urban public services. This is the same course as Ec 431 and RE 431 may only be taken once for credit.

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 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 graduate-level credit as USP 534 and may be taken only once for credit.. Prerequisite: Upper division standing..
USP 438 -Real Estate Law (3)
Provides students with a comprehensive summary of real property froma legal perspective with an emphas is on transactional is sues. 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 responsibilities 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 graduate students: RE 521.

Also offered for graduate-level credit as USP 538 and may be taken only once forcredit.. Prerequisite: Ec 201 (undergraduates). . Cross-Listed as:RE438.

## USP 439 - Workforce Development (3)

Introduction to policies and practices for workforce development. Topics dis cussed 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 hous ehold, 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-divis ion standing..

## USP 440 - Meas uring People and Communities in the Urban Context (4)

This is an applied research methods course that provides students with the essential data skills for quantitatively measuringsocial, economic, and demographic trends across urban places. The course provides students with an appreciation for underlying theoretical and practical research methods for identifying, meas uring, and conceptualizing trends specific to urban places.

Prerequisite:upper-division standing..

## USP 445 -Cities and Third World Development

 (3)Critical survey of historical, economic, cultural, political, and urban aspects ofThird W orld 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-independenceperiod, 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. This is the same course as Intl 445 and may be taken only once for credit.

Also offered for graduate-level credit as USP 545 and may be taken only once forcredit.. Cross-Listed as: Intl 445.

## USP 451 -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 problemsolving activities of local governments and community-based organizations. Business and commercial development strategies are also explored.
Also offered for graduate-level credit as USP 551 and may be taken only once forcredit..

## 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 forthe uses ofgeographic 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 andownership; the relationship between local planning and regulations; and current issues and perspectives on landuse 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 once forcredit..

## USP 456 - Urban Transportation: Problems and Policies (3)

An introduction to urban transportation policy froma historical and political pers pective. Historical developments in transportation policy are traced from the early streetcar days up through the present. Federal, state, and local transportation policies are examined fortheir impact on urban spatialand economic development. An overview of current issues in transportation policy and planning includes transportation demand managementstrategies, 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 graduate-level credit as USP 556 and may be taken only once forcredit..

## 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 transnationalization 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 forcredit..

## USP 460 - Community Development Field Seminar (2-6)

Participant observation through placement in a community-based organization actively engaged in community development activities on behalfofa 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.

Prerequis ite: Completion of the Community Development Core (USP 300U, 301, and 302) and at least one course fromamong 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 trans portation in a sus tainable urban environment. Covers planning, design, implementation, and maintenance ofbikeways 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 once for credit..

## USP 468 - Oregon Land Use Law (3)

The Oregon programis placed in a national context that stresses 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 Oregon Land 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 once forcredit..

## 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 works hop will be presented to the public.
Also offered for graduate-level credit as USP 575 and may be taken only once forcredit.. 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 nonprofit activity in the economy, the interdependence of 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 organizations in developing countries and the future of nonprofits in a global economy.
Also offered for graduate-level credit as USP 580 and may be taken only once forcredit..

## USP 490 - Green Economics and Sustainable Development (3)

Examines prevailing as sumptions about economic growth, production, consumption, labor, and leis ure. 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 graduate-level credit as USP 590 and may be taken only once forcredit..

## 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 once forcredit..

## USP 496 - Affordable Housing Finance (3)

Introduction to the unique challenges 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 uniquechallenges for investors, jurisdictions, and community-based groups. Expected preparation: USP 312.
Also offered for graduate-level credit as USP 596 and may be taken only once forcredit..

## 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 businesseducation, or for those students who desire a course in basic financeand real estate concepts 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 analys is, an introduction to real estate valuation measurements; and analysis of performancerisk versus return. Students also receive an overview of the legaldefinitions of real estate and its forms of ownership, as well as an overview of real estate title, contract, regulation, and financing issues.
Recommended prerequisites: Ec 201 and 202.

## USP 499 - Real Estate Finance and Investments (3)

Application offinance and economic principles to analys is of real estate finance and investments. Emphas is on the development of problemsolving capabilities through the useof computer application programs. Specialattention is given to risk analysis, alternative mortgage instruments, hedging techniques, and the taxeffects of real estate 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 - Pedes trian 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 pasttwo years.

Also offered for undergraduate-level credit as USP 411 and may be taken only once for credit.. Prerequisite: juniorstanding..

USP 512 - Environmental Planning Methods (3)
Examination of the patterns and processes in humandominated landscapes, and the tools for understanding human behavior and decision making. By applying severalenvironmental 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 use on watersheds, sustainability design, environmental impact as sessments, and environmental modeling and simulation. Focus is on the application of tools to addressing pressing problems of regional significance. 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 includehistory and theory ofconcepts of public space, as well as contemporary case studies and field assignments to understand the production and maintenanceof public spaces around Portland.

Also offered for undergraduatecredit as USP 413 and may be taken only once for credit.. Prerequis ite: upper-division or graduate-level standing..

## USP 514 -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 undergraduate-level credit as USP 414 and may be taken only once for credit.. CrossListed 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 is sues, and to reflect on cultural, economic, and socio-political dimens ions 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 environmental quality and quality-of-life; 3 . reducing poverty and income inequality. This course provides students the ability to analyze and as sess alternative policies through an understanding of the theoretical foundations of urban growth and decline; through the ability to apply analytical methods for as sessing policy effectiveness; by examination of evidence of policy effectiveness; by reviewing case studies; 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 and urban form, technologies of energy supply and demand, social institutions governing access to energy, and cultures of consumption. Currentsocial 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 theenvironment, 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 data sources, population characteristics and change, and measures ofmortality 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 analysis, 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 analysis. The topics to be covered are: data sources, internal and international migration, data evaluation, population estimates, and projection projections. The course will cons ist of readings, lectures, laboratory sessions, 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 student research 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 dealmaking phases of the development process, as well as the development and managementstages. 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. Slides how lectures, downtown walking tours, and a termproject 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 clas s 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 is sues 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, res idential choice; residential segregation; neighborhoods in the political process; and neighborhood conservation strategies. Recommended prerequisite:juniorstanding. 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 overtime. 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, clas sroomd is 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-level credit 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 communitybased 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 substantialindependent 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 adminis tration, and planning theory literature to understand risk, resilience, and methods to address these at the community level.

Cross-Listedas: This is the same course as EMCR 530 and may be taken only once for credit..

## USP 531 - Geographic Information Systems (GIS) for Planners (4)

Introduction to principles and methods of collecting, organizing, analyzing, and visualizing geographic information. Explores types and sources of geographical data used in urban and regional studies and planning with an emphasis on Census data. Provides an overview of principles and components of Geographic Information Systems (GIS) as a primary tool of spatial data analysis and visualization. Attention is given to practical
applications of GIS and to developing essential skills in desktop mapping and spreadsheet software.

## USP 532 - Data Collection (4)

The acquisition of data for research in an urban context. Emphasis 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 underg raduate 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 useof 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 highesteconomic return and/or the greatest environmentalbenefits. 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 for credit..

## 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 issues 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 is sues that arise in costbenefit analysis, such as present valuecalculations, determining the value ofnon-market benefits, and correctly evaluating costs. Recommended prerequisite: USP 515 orequivalent.

## USP 537 -Economics of Urban Transportation (3)

The transportation system is critical to the functioning of an urban area. Themovement of
people and goods affects both the productivity and livability of the region. Transportation systems also affect and are affected by land use and location decisions. This course presents theeconomic analysis of urban transportation. This will include analysis of the effects of transportation systems on land use and location as well as the evaluation of transportation investments. These methods will then be applied to evaluation of various proposals to improve the urban trans portation system. Recommended prerequisite: USP 515 or 615.

## USP 538 -Real Estate Law (3)

Provides students with a comprehensive summary of real property from legal perspective with an emphas is on transactional is sues. 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 responsibilities of owners and trans ferors/transferees of real property. This is the same course as RE 538S 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.. CrossListed as:RE 538S.

## USP 539 - Workforce Development (3)

Introduction to policies and practices for workforce development. Topics dis cussed 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 hous ehold, 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: philosophical issues and politicalorganization contexts of professional activity; the place of 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 theperspectives 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 issues 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 adminis trative review; and programs, e.g., growth management, capital improvements, community development, housing assistance plans; and political-procedural issues, e.g., permit streamlining, cost impacts.

## USP 543 - Geographic Applications to Planning (4)

Principles and models of spatial organization, behavior, and location in geographic space. Major conceptual models of urban structure and form, urban regional hierarchy, transportation 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). Discussion of real-life GIS applications to transportation, land use, environmentalplanning, 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 analys is, evaluation and decis ion making, plan implementation, and programmanagement. Exposes students to processes and analytical methods from multiple disciplines, such as law, politics, engineering, sociology, economics, finance, management and marketing. Emphasis on analysis of moderately complextechnical 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 his torical, economic, cultural, political, and urban aspects ofThird W orld development, starting with the colonial era. Historical patterns of integration of the Third W orld 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, hous ing, 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 es tate development through analys is of case studies. Provides students the experience of developing a comprehensive and unified analysis of a commercial real estate 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 willwork closely with industry participants and faculty to develop their analys is 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 resourcescarcity, environmentaldegradation, 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 trans it ridership and investments have been growing for the pasttwo decades as regions around the world grapple with worsening congestion,
growing concerns aboutclimate change, health, and social equity, and a reinvigoration of urban living and sustainable lifes tyles. 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 history of regional planning, including the evolution of thoughtregarding regionalismand the nature of regions. Examples of regional plans will be used as the basis for examining assumptions, 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 andmethods for creating participatory planning. Demonstrates the linkage between frameworks and concepts such as collaborative planning, deliberative democracy, equity planning, and the co-production of plans and applied work. Considers various processes, techniques, and tools to foster equitable community engagement. Students design a participatory process for clients.

## 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 trans formations on local labor markets and surveys the labor-market problemsolving activities of local governments and community-based organizations. Business and commercial development strategies are also 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 dis course 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 locallevel. Requirements forthe 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 555 -Land Use: Legal Aspects (3)

Land use and planning fromthe legal perspective. Includes his torical 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 pers pective. 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 spatialand economic development. An overview of current issues in transportation policy and planning includes transportation demand managementstrategies, 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 transnationalization 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 program includes strategies, methods, and skills needed to identify issues and draw together all participants in the search for solutions. Emphas is is on the blending of practical skills with knowledge gained from corearea courses. Two-termsequence, 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 graduate students admitted to the MURP degree programto share information regarding securing internships and the work products associated with internship experiences. An annual calendar for the seminar will be posted at the beginning ofthe year. Attendanceat 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 response of society to a changing climate, with an emphasis 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 fromplanning, sociology, engineering, en vironmental studies, and dis aster studies, and other related fields. We will also pay special attention to the interplay between social inequality, poverty, social exclusion and vulnerability to natural dis aster.

Cross-Listedas:This is the same course as EMCR 560 and may be taken only once for credit..

## USP 562 -Real Estate Development Workshop (3)

Students forma real estate development teamand 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 demonstrate and apply mastery of the development concepts 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 real estate construction process, including materials, cost estimating procedures, budgets, schedules and legal procedures. Emphasis on the selection ofbuilding systems and review of the forms of construction contracts and associated documents commonly used in the industry. Reviews lessons learned fromcase studies.
Prerequisite: RE 521 ..

## USP 564 -Political and Administrative Issues in Aging (3)

Coverage of organizational dynamics as related to the elderly including the provision anduse 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-level credit 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 tosocial welfare and economic development, with an overview of other policy arenas such as housing, health, and education. Critical analysis of how and why the federalgovernment responds to urban crises
with national policy initiatives and how changes in political regime corres pond with changes in policy emphases and perspectives.

## USP 567 - Urban Housing Policies (3)

Review of the his tory and the role of public policy in the housing sector. Study of past and current trends in the delivery ofhousing 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. Equalattention 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 Oregon programis placed in a national context that stresses 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 Oregon Land 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. Bas ic technological and theoretical models of human-nature interaction will be cons idered, along with visionary possibilities for the future of cities and urban regions, globally and in Portland. Particular attention will be given to globallocal interactions and to the strategies, programs, policies, and tools that can deliversustainable 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 ofhighway and transit changes on travel behavior, locational decisions, and urb an 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-state tensions, representation and analysis of stakeholding interests, the role of the media, and environmentaljustice are key elements. Topical areas include issues concerning resource 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 baseor 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/or evaluation of policy changes on regional development. Recommended prerequis ite: 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, transportation 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 reales tate 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 RE 521 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 reformsociotechnical systems-linking actors, institutions and values to the built and natural environment. Drawing from science and technology studies, this course analyzes socio-technical systems and thechallenges to navigating 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 permission of the ins tructor..

## 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 managementofurban environmentalproblems, with particular emphasis on "best practice" and emerging ideas. Selected topics may include: watershed stewardship, brownfield development, green spaces, protection of urban wildlife, stormwater management, urban agriculture, res idential toxics.

## USP 578 - Impact Assessment (3)

Empirical techniques employed in measuring the impacts associated with land usechange. Topics: goals achievement matrix approaches to impact as sessment, trade-offs between community and regional welfare, distance and time in urban analysis, estimating the social profitability of land development, cost-benefit analysis applied to freeway location, techniques forvaluation ofnon-priced res ources, measuring municipal revenue and expenditure impacts, gravity models and transport demand estimation, economic base analysis for employment and population impact assessment, estimating air and nois epollution as sociated with land development. Recommended prerequisite: USP 515.

## USP 579 - State and Local Public Finance (3)

The course will focus on the taxburdens, fiscal resources, 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 dis tribution 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 nonprofit activity in the economy, the interdependence ofgovernment and nonprofit organizations in the modern state, and the role of think tanks in shaping public policy. Surveys the dramatic rise of non-governmental organizations in developing countries and the future of nonprofits in a global economy.

Also offered for undergraduate-level credit as USP 480 and may be taken only once for credit..

## 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 andurban design, community and neighboring in the city, and environmentalcognition.

## USP 582 -Sustainable Trans portation (3)

This course covers the sustainability dimensions of trans portation, considering his torical trends and future prospects. Topics covered in the course include energy use and alternative energy sources, technological change, traffic safety, vehicle emissions, environmental justice, the role of trans portation in the economy, and the role of land use and urban design.

Prerequisite: graduate standing..

## USP 583 - Trans portation Finance (3)

Much of the current funding for roads, transit, and freight comes fromfuel taxes; but increasing fuel efficiency of vehicles and the use of alternative energy sources raisequestions about the long-term viability of this revenue source. This course will existing trans portation finance 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 includenegotiation 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 onaging 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, accessible and inclusive environments, 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 social psychological and anthropological literature on social networks: the structure and content of interpersonal 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 resources, methods of analyzing pers onal and group networks.

## USP 587-Travel Demand Modeling (3)

Understand, analyze, and apply travel demand forecasting models froman applied and practical perspective. The underlying theoretical bas is 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-onuse of transportation modeling software.

Prerequisite: an introductory course in urban transportation planning or professional experience in urban transportation planning; familiarity with spreadsheet software; college-level algebra; and introductory statistics (i.e., regression analysis). 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 ocioenvironmental change and provides a foundation for subsequent indepth studies of particular sustainable development strategies and analytic techniques. Students study a broader rangeofsustainable development topics, tools, and techniques.

## USP 589 - Theorizing Urban Natures (4)

This seminar examines various ways of understanding urban "nature". Students will contrast dominant ecological frameworks with those used in the social sciences (e.g., urban political ecology, actor-network theory), with attention to the social, political, and economic contexts in which they arose, and implications ofeach for research, practice, and politics.

## USP 590 - Green Economics and Sus tainable Development (3)

Examines prevailing assumptions 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 appropriates cale, 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 as pects of database design. Students will use 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 spatialdata. 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 for credit. 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 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. 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.

Corequis ite: 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 analysis, 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 somewhat systematic and certainly eclectic cultural overview of the region they hope to serve. This course will attempt to prepare themto 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 profes sional development. Though focused on the Pacific Northwest, 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 formof the good city and the societal implications of development patterns; is sues of residentialchoice, community change, globalization, and environmental protection as affected by metropolitan growth.

## USP 596 - Affor dable Housing Finance (3)

Introduction to the unique challenges 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 illus trate the ways in which financing for affordable housing is created and used, and poses uniquechallenges for investors, jurisdictions, and community-based groups. Expected preparation: USP 312.
Also offered for undergraduate-level credit as USP 496 and may be taken only once for credit. .

## USP 597 -Regional Economic Analysis (2)

Reviews analytical tools and datasources and provides hands on training for applying themto questions aboutregional economies. Includes demographic analysis, regional business structure, analyzing regional economic change, labor market analys is, researching firms, and conducting cluster analys is and economic opportunities analysis. Expected preparation: basic statistics.

USP 601 -Research (0-9)
(Credit to be arranged.)

USP 602 - Independent Study (1-9)
(Credit to be arranged.)

## USP 603 - Diss ertation (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 -SelectedTopics (0-9)

(Credit to be arranged.)

## USP 612 -Community, Planning, and Ethics (4)

Introduction to the history and theory of community development in North America, the theory and practice of urban planning in North America, and to the ethics of civic and business practices linking the public, private, and non-profit sectors. It examines the tensions among market-based development, community action, and public intervention. Topics range in scale fromhous ing style choices to aggregate trends in metropolitan form and 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 folitical processes with specific consequences for different constituencies within thecity.

## USP 613 -Urban Economic and Spatial Structure (3)

Provides an introduction to theeconomic and spatial aspects relevant to the field ofurban 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 chang ing 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 responses 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 for entering graduate students with a limited background in economics. Develops basic analytic methods and emphas izes application of the analysis to is sues of public policy. Prepares students for advanced classes that use this type of analysis.

## USP 616 - Cities in the Global Political Economy

 (3)Introduction to political theory and the political economy of globalization. Begins with core political ideas fromclassical works of political economy (Locke, Rousseau, Smith, Mills, Marx, Marshall, Keynes, Friedman, and Rawls) and proceeds to an analys is of the rise of transnationalismand globalization. Looks at changes in the global economy, 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 ofimportant theories of andempirical research about the social structure and political dynamics of urban areas. The impacts of globalization on urban 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 widerurban community and policy goals such as affordable housing, community redevelopment to economic development, and sustainability. The course looks at how public and private organizations can meet policy goals, create economic 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 ofdesign with broader community concerns and developer's objectives, and the management of the design process, including tools fordecision analysis in all phases of the building design process. A primeron 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 estate problems, including the rehabilitation and
adaptivereuse of existing real estate properties. Properties being covered includeretail, office, hotel, industrial, and residential properties. The class will examine techniques for increasing 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 prerequis ite: USP 430.

Corequisite: USP 630L.

## USP 630L-Research 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.
Corequisite: USP 634.

## USP 636 -Political and Economic Decisionmaking (3)

Examines the philosophical and conceptual as sumptions embodied in alternative decis ion-making theories in the fields of economics and politics. Des igned to show students the differences in individual and collective decision-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 twocourse 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 654L) 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 analys is. Topics covered includepath 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 discrete 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 legislatures, 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 fromfederal, state,
and local governments with special consideration given to the intergovernmental as pects of the policy process.

## USP 663 - Program Evaluation (3)

This course is designed as a graduate introduction to the field of evaluation research and program evaluation. Topics covered include contemporary and emerging theoretical perspectives 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 data to identify and anticipate future patterns of human activity in metropolitan areas and systems of cities. Emphasizes techniques to establish whether the characteristic landscapes as sociated with static and dynamic models of behavior are present. Diffusion processes, expanded location theories, and models of decision making from spatially 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 resources and expenditure patterns of local governments in metropolitan areas. Theimpact of revenue sharing and categorical grants. The spatial dis tribution of local government services, transfer payments, and taxburdens. Review of literature on the urban-suburban exploitation thesis, the TieboutOates model, etc.

Prerequisite: USP 515..

## USP 682 -Sustainable Trans portation (3)

This course covers the sustainability dimensions of transportation, considering his torical trends and future prospects. Topics covered in the course include energyuse 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: graduatestanding.

## USP 683 - Qualitative Analysis (4)

Study of a variety of qualitative methods of analyzing social science problems, with an emphasis on applications to urban studies. Students study the philosophy of academic inquiry, understanding and interpretation of social action. 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 - Research Design 2 (4)

Research seminar required for students in urban studies doctoral program; open to MUS and other advanced 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 ofdata 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 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 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 Term3 (4)
Elementary work in the Vietnamese language with emphasis on listening comprehension, speaking, grammatical patterns, reading, and writing. Includes dis cussions 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)

W ork 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 sequence of three: Viet 201, Viet 202, and Viet 203.

## Viet 202 -Second-Year Vietnamese Term 2 (4)

W ork in the Vietnamese language focusing on various cultural aspects of Vietnamese life. The languageskills include speaking, lis tening, 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 Term 3 (4)
W ork 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 third course in a sequence of three: Viet 201, Viet 202, and Viet 203.

## WLL - World Languages \& Lite rature

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 is sues. May be repeated with different topics. 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 ofdepictions in literary works ofgender and sexual identity, orientation, or practice that differs from that 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- Bests ellers and Blockbusters (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 Citizens hipin Professional Contexts (4)

Designed forstudents who are interested in developing a better understanding of today's global is sues and ascertaining possible strategies to be functional in a global setting. Through hands-on projects, students will develop strategies to help them break down cultural barriers, challenge stereotypes, appreciatedifferences 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 emphas is 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 for credit..

## WLL 381 - Topics in Translation Studies (4)

Students will develop analytical 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 from Translation Studies enrich the study of literary and non-literary texts alike. Those with second-language competency can optionally develop skills to produce translations of their own. This course may be repeated for up 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 comic-book genres across two or more world cultures; readings (viewings) of texts/films are followed by dis cussion of cultural differences. Students also learn how to dis cuss genre differences and how cultural attitudes shape those different artistic responses and appropriations of global artistic ideas. Analysis of critical texts revealhow 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-Listedas: 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 linguistic 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 language education 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 graduate-level credit as WLL 538 and may be taken only once for credit. . Prerequisite: Upper-division standing.

## WLL 448 - Major Figures in WorldLiterature (4)

Concentrated study of the canon of one or more major writers: for example, Dostoevsky, Cervantes, Goethe. Expected preparation: Sophomore Inquiry or 12 credits of literature. Conducted in English.

## WLL 448U-Major Figures in WorldLiterature (4)

Concentrated study of the canon of one or more major writers: for example, Dostoevsky, Cervantes, Goethe. Recommended prerequisite: 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 WLL 547 and may be taken only once for credit. .

## WLL 493 - Language Proficiency Testing and Teaching (4)

Application of proficiency standards in testing and teaching at the novice and intermediatelevels. Introduction to ILR/ACTFL/ETS/FSI guidelines and compatible testing methods. Discussion of pragmatic is sues: testing technique and test validity; use of 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. Special emphasis on dis course and content analys is. Recommended for prospective language teachers. Expected preparation: threeyears 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, andeducational possibilities ofdigital environments as they are used in social, professional and world language education settings. Students will analyze and assess a variety of online environments for theirown language learning or can choose to focus on research or pedagogical projects.

Als o offered for undergraduate-level credit as WLL 438 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 WLL 447 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 criticism. 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 intermediatelevels. Introduction to ILR/ACTFL/ETS/FSI guidelines and compatible testing methods. Discussion of pragmatic is sues: testing technique and test validity; use of teaching materials; logistics. Expected preparation: three years of a foreign language. Conducted in English.

Also offered for undergraduate-level credit as WLL 493 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. Special emphasis on dis course and content analys is. Recommended for prospective language teachers. Expected preparation: threeyears of a foreign language. Conducted in English.

Also offered for undergraduate-level credit as WLL 498 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-levelwriting.

## 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 basic techniques of developing character, point of view, plot, and story idea in fiction. Includes discussion 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 personal 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 Research 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 organization 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 leam to gather local news, writing some stories in a computer lab on deadline. Expected preparation: Wr 121 or Freshman Inquiry. May berepeated 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 criticalanalysis, generic conventions, and writing processes. Course may be repeated forcredit with different topics for up to 8 credits. Up to 8 credits of this course numbercan 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 ofentering scholarly conversations.

## Wr 312 - Intermediate Fiction Writing (4)

Builds on fictional techniques introduced in Wr212, including variations on the classic plot, complex points of view, and conventions of genre. Emphasizes discussion of student work. May be repeated once for credit.

Prerequisite: B orhigher in Wr212, or consent of instructor based on a writing sample..

## Wr 313 - Intermediate Poetry Writing (4)

Continues thestudy of poetry writing techniques introduced in Wr213. Includes additional instruction in poetic forms, variations on traditional forms, and experimental forms. Emphas izes discussion of student work. May be repeated once for credit.
Prerequisite: B or above in Wr 213 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 ofnews 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 - Des ktop 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 Publis hing for Writers (4)

Provides an overview of the book publishing process, organized around the division of labor typically found in publishinghouses. Through readings, discussion, and participation in mock publishing companies, students learn about editorial, 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 333H- Advanced Composition ()

## 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 form and process. Coursemay 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 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 forcredit with different topics for up to 8 credits. Up to 8 credits of this course numbercan be applied to the English major.

Also offered for graduate-level credit as Wr 500.. Prerequisite: Upper-division standing..
Wr 402 - Independent Study (1-12)
(Credit to be arranged.)

Wr 403 - Thesis (1-12)
(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 -Selected Topics 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 thoseskills 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 graduate-level credit as Wr 511.. Prerequisite:Permission of ins tructor..

## Wr 412 - Advanced Fiction Writing (4)

Students can expectto write longer and more ambitious works of fiction, while exploring a variety of technical problems and other questions emerging from class 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 for credit.

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 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 Wr 520 . . Prerequisite: Upper-divisionstanding..

Wr 424-Grant Writing for Profes sional Writers (4)

Introduces students training for careers as profes sional 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 forcredit.. Prerequis ite: Upper-division standing..

## Wr 425 - Advanced Technical Writing 0

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 nonprofits. Coursetopics 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 forcredit.. Prerequis ite: Upper-divis ion 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 the Plain English Movement and its legis lative and legal implications.
Also offered for graduate-level credit as Wr 526 and may be taken only once for credit..

## Wr 427 -Technical Editing (4)

Gives technical writers practice in technicalediting by exposing them to samples of a variety of documents from the files oforganizations 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 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. Expected preparation: Wr328.
Also offered for graduate-level credit as Wr 528 and may be taken only once forcredit. . Prerequisite: Wr 228..

## Wr 429 - 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 fornon-technical and semitechnical audiences. Expected preparation: Wr 327, 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 forcredit. .

## 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 forcredit..

## Wr 431 -Advanced Topics in Technical Writing Technologies (4)

An introduction to a contemporary technology used by technical 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 part of a professional practice. This course is repeatable forup 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 thats hape 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 choiceand produce a portfolio to share findings.

Also offered for graduate-level credit as Wr 532 and may be taken only once forcredit.. Prerequis ite: Upper-division standing..

## Wr 433 - Res earch Methods for Technical Writers (4)

Introduces students to the research methods commonly practiced by professional technical writers. These methods include interviewing subjectmatter experts, researching genre conventions, user research, websitecontentanalysis, and usability testing. Students will practice methods via clientprojects 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 forcredit.. Prerequisite: Upper-divis ion 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 rhetorical effects.
Also offered for graduate-level credit as Wr 535 and may be taken only once forcredit.. Prerequisite: Upper-divis ion 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 forcredit. . Prerequisite: Wr 214 or Wr 228. Instructor approval required..

## Wr 457 -Pers onal Essay Writing (4)

The history and contemporary use of personal essay 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: Wr 214 or Wr 228. Instructor approval required..

## Wr 458 -Magazine Writing (4)

Examines the development of both long-and shortform 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 term for 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 divis ion 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 once for credit. . Prerequisite: Upper-divis ion standing..

## Wr 461 - Book Editing (4)

Provides a comprehensivecourse in professional book editing, including editorial management, acquisitions editing, substantive/developmental editing, and copyediting. Is sues specific to both fiction and nonfiction books will be covered.
Also offered for graduate-level credit as Wr 561 and may be taken only once forcredit. . Prerequisite: Upper-divis ion 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 both old 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: Upper-divis ion 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 advertis ing copy, and develop related marketing materials.

Also offered for graduate-level credit as Wr 563 and may be taken only once forcredit. . Prerequisite: Upper-division 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 bookselling. Students learn how a variety of agents, including publishers, publishing services companies, dis tributors, wholesalers, books tores, etc., are organized.

Also offered for graduate-level credit as Wr 564 and may be taken only once forcredit. . Prerequisite: Wr 460..

## 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. Dis cus ses the importance of the Internet in rethinking copyright and intellectual property rules.

Also offered for graduate-level credit as Wr 565 and may be taken only once for credit. . Prerequisite: Upper-division 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, multimodal es 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 forcredit.. 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 forcredit. . Prerequisite: Wr 462..

## Wr 472 -Copyediting (4)

Learn how to improve the clarity, coherency, cons istency, 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 once forcredit. . 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 forcredit. . Prerequisite: Wr 461..

## Wr 474 - Publis hing 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 Managementand 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 forcredit. .

## 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 forcredit. . Prerequisite: Upper-division 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 forcredit.. Prerequisite: Upper-division standing..

## Wr 480 - Advanced Book Design (4)

Builds upon the Adobe InDesign, Photoshop, Illustrator, and A crobatskills thatstudents developed in WR 462/562 Book Design Software and further applied in WR 471/571 Typography, Layout, and Design. This class utilizes hands-on design projects that incorporate more advanced book design 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 forcredit.. 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 forcredit.. 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 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 for course 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 -SelectedTopics 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 thoseskills 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-level credit as Wr 411.. Prerequisite: Permiss ion of instructor..

## Wr 512 - Graduate Fiction Writing (4)

Students will further refine their skills by writing longer and more ambitious works offiction, as well as confront a variety of technical problems emerging from class discussion.

## Wr 502 - Independent Study (1-6)

(Credit to be arranged.)

## Wr 513 - Fiction Writing (4)

An intensive course for writers who are currently embarked on a project involving the writing of fiction, whether shortstory, novella, or novel. Recommended prerequisites: 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, assumes students will submit their work for publication. Traditional workshop 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 for credit.

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 W orkshop in Fiction focuses on the writing, revision, and critical dis cussion of student short stories and chapters fromnovels. 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 offiction. May be taken up to six times 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 W orkshop 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 published poems representing a range offormal strategies and historical and cultural contexts, and by their reading in prosody and poetics. May be taken up to six times 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 emphasis on the in-class workshop and peer review of student pieces. Nonfiction models, both short pieces and book-length, will be read and discussed, and students will write critical responses regarding those models. Maybe takenup to sixtimes for credit. This course is restricted to graduatestudents 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-level credit as Wr424 and may be taken only once for credit..

## Wr 525 -Advanced Technical Writing (4)

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 nonprofits. 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 personal or programprofessional portfolio.

Also offered for undergraduate-level credit as Wr425 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, 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 the Plain English Movement and its legis lative and legal implications.

Also offered for undergraduate-level credit as Wr426 and may be taken only once for credit..

## Wr 527 - Technical Editing (4)

Gives technical writers practice in technical editing by exposing them to samples of a variety of documents from the files oforganizations 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 Wr428 and may be taken only once for credit..

## Wr 529 - Writing Computer Documentation (4)

Develop skills in writing computer documentation, primarily user manuals and systemspecifications. Focuses on analyzing informational needs of the audience, and defining and explaining computer terms and concepts for non-technical and semitechnicalaudiences. Expected preparation: Wr 327, ISQA 111 or CS 105 or equivalent, word processing skills.

Also offered for undergraduate-level credit as Wr429 and may be taken only once for credit. .

## Wr 530 -DesktopPublishing II (4)

Builds from the foundation in Desktop PublishingI 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 undergraduate-level credit as Wr430 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 part of 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 themany frameworks for understanding the fundamental questions that shape technicalwriting as a practicein 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 undergraduate-level credit 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 subjectmatter experts, researching genre conventions, user research, website contentanalysis, and usability testing. Students will practice methods via clientprojects 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 usage, with focus on the relationship between sty listic choices and their rhetorical effects.

Also offered for undergraduate-level credit as Wr435 and may be taken only once for credit. . Prerequis ite: Senior or graduatestatus.

## Wr 556 - 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 undergraduate-level credit as Wr 456 and may be taken only once for credit. . Prerequisite: Wr214 or Wr 228. Instructor approval required..

## Wr 557 -Pers onal Essay Writing (4)

The history and contemporary use of personal essay as a mode of creative communication; gives an understanding of and practice in this kind of writing.

Also offered for undergraduate-level credit as Wr457 and may be taken only once for credit. .

## Wr 558 -Magazine Writing (4)

Examines the development ofboth long- and shortform 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 Wr458 and may be taken only once for credit. .

## Wr 559-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 undergraduate-level credit as Wr459 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, 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 from the publishing industry and field trips provide exposure to the industry.
Also offered for undergraduate-level credit as Wr460 and may be taken only once for credit.
Wr 561 -Book Editing (4)
Provides a comprehensivecourse in professional bookediting, including editorial management, acquisitions editing, substantive/developmental editing, and copyediting. Issues specific to both fiction and nonfiction books will be covered.

Also offered for undergraduate-level credit as Wr461 and may be taken only once for credit..

## Wr 562 -Book Design S oftware (4)

Provides a strong foundation in design software used in the book publishing industry, focusing on Adobe InDesign. Also explores Adobe Photoshop, Illustrator, and A crobat, as well as XHTML and ebook design. The class considers audience expectations through a range of hands-on design projects.
Also offered for undergraduate-level credit as Wr462 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 advertis ing copy, and develop related marketing materials.

Also offered for undergraduate-level credit as Wr463 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, distribution, and bookselling. Students learn how a variety of agents, including publishers, publishing services companies, distributors, wholesalers, bookstores, etc., are organized and function in the marketplace.
Also offered for undergraduate-level credit 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 A mendment law, defamation, right of privacy, trademark, trade secret law. Discusses the importance of the Internetin rethinking copyright and intellectual property rules.

Also offered for undergraduate-level credit as Wr465 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 Wr466 and may be taken only once for credit..

Wr 571 - 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 undergraduate-level credit as Wr 471 and may be taken only once for credit. . Prerequis ite: Wr 562 ..

## Wr 572 -Copyediting (4)

Learn how to improve the clarity, coherency, cons istency, 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 undergraduate-level credit as Wr472 and may be taken only once for credit. . Prerequis ite: Wr 561 .

## Wr 573 -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 undergraduate-level credit as Wr473 and may be taken only once for credit. . Prerequis ite: Wr 561..

## Wr 574 - Publis hing 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, ExternalPromotions, Sales, Digital Content, Social Media, and Project Managementand Operations. May be taken multiple times for credit.

Also offered for undergraduate-level credit as Wr 474.. Prerequisite: Wr 575..

## Wr 575 - Publis hing 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. 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-level credit as Wr476 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 Wr477 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 Publis hing (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 for credit.

## Wr 580 - Advanced Book Design (4)

Builds upon the Adobe InDesign, Photoshop, Illustrator, and Acrobatskills thatstudents developed in WR 462/562 BookDesign Software and further applied in WR 471/571 Typography, Layout, and Design. This class utilizes hands-on design projects that incorporate more advanced book design skills in terms of workflow, indexing, illustrations, visual data representations, etc.

Also offered for undergraduate-level credit as Wr480 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 Wr481 and may be taken only once for credit.. Prerequisite: Wr 562 .

## WS - Women's Studies

WS 101 - Introduction to Women's Studies (4)
An overview of a range oftopics 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 - Workshop for 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 is sues in feminis $m$. Recent offerings have included History of Women Artists and His tory of W omen in Science. WS 199 is also available for students who wish to pursue directed 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 - Gender and Critical Inquiry (4)

Engages students with a rangeof 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. Emphas is on the development of close reading and critical analysis using a range of sources and approaches.
Prerequisite: WS 101 or UnSt 231 or permission 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 activism, 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 canbe studied 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 307 - Resistance, Activism, and Social Change

 (4)Focuses on activis mofself-identified feminists as they resist and transformoppression. Emphasizes queer and feminist activismallied with other social movements. Examines activis ts' strategies, tactics, org anizations, goals, accomplis hments, and unmet challenges. Topics may include reproductive justice, labor organizing, queer political movements, indigenous and transnational liberation movements, or climate justice.
Prerequisite: WS 101 or UnNSt 231.

## WS 308U- Topics in Gender, Literature, and Popular Culture (4)

Explores media, popularculture, and/or literature from a feminist pers pective which focuses onhow gender and other dimensions of power relations are expressed, reproduced, and challenged within cultural expression. Topics may includegender 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 - Dis ney: Gender, Race, and Empire (4)

Explores construction ofgender, race, and empire in the animated films of Disney. Examines the content of Disney films created within particularhistorical and cultural contexts in order to understand cultural production in relation to intersections of racism, sexism, colonialism, and imperialism.

## WS 310U- Ps ychology of Women (4)

Review and evaluate as sumptions underlying psychological research on women. Survey the research in areas such as the development of sex differences, 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 mental health, and the women's movement. Recommended prerequisite: 3 credits in psychology.

## WS 312U-Feminist Philos ophy (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 315 - Feminist Analysis (4)

An advanced feminist theory course exploring a range of theoretical frameworks and research strategies utilized in contemporary feminist scholarship, including debates within feminism. Draws on approaches fromseveral disciplines to define key features of feminist analysis, apply feminist theoretical approaches to current issues, and build a theoretical analysis.

Prerequisite: WS 301 or WS 305.

## 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 workshops, serve as writing partners/coaches with each other, and work cooperatively to complete community-based, writinginvolved 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 res earch 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 331 U- Women in 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 for credit.
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 dis courses 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 ofsimilarities and differences in male and female communication styles and patterns. Particularattention given to the implications of gender as social construct 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, es pecially Native women, A frican women, and European women. Key themes include
family, kinship, and sex-gender systems; colonialism and slavery; religious life; politics and the law; nation-building and the rise of modern citizenship. Recommended prerequis ite: upperdivision standing.

## WS 341 U- Women and Gender in America 18481920 (4)

Explores the diverse experiences of women in the United States between 1848 and 1920. Key themes include slavery, emancipation, and Reconstruction; colonialismand resistance; women's rights and social reform; education and wage labor; immigration/migration; and Victorianismand sexual modernism. Recommended prerequisite: upper division 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 prerequis ite: upperdivision standing.

## WS 343 U- American Family History (4)

History of the American family from the colonial period to the present. The course will drawupon textualsources andoral his tories 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, dis ability, race, social class, 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 ofgenetics, molecular biology and biotechnology within social and historicalcontext. Emphas is on the ethical is sues
arising from the 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)Cons iders how gender, race and sexuality influence and are constructed by the theories and practice of science, usinghis torical 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 courseto 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-S cience, Gender, and Social Context (4)

Considers how gender, race and sexuality influence and are constructed by the theories and practice of science, usinghis torical and contemporary examples. Explores the strengths and limitations of science to describe and predict human and non-human natural phenomena. Topics may include organismal, cell/molecular, or biomedical 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 Sci 348U and may only be taken once for credit..

## WS 349U-Gender and International Development (4)

Examines how the material benefits of globalization and development projects are not shared equally across gender(s). Evaluates how development theory and practice address poverty, health, environment, sexuality, population, domestic/paid work. Also examines the emergence of civil society; patterns of violence and political participation globally. This is the same course as Intl349U and may be taken only once for credit.

Cross-Listed as:Intl349U.

## WS 350 - Introduction to Interpersonal Violence

 (1)Explores the roots of interpersonal violence, the dynamics ofdomestic 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 interpers onal violence and how all forms are interrelated.

## WS 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 organizations 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-lis ted as ELP 455; may only be taken once for credit.

## 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 A wareness and Domestic and Sexual Violence. Each class will cons ider physical, emotional and sexual abuse. This is the first course in a sequenceof 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 Prison; WS 356: Diversity A wareness 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 cons ider 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 Interpers onal 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, emotionaland sexual abuse is sues. This is the first course in a sequence of three: WS 357, WS 358, and WS 359. Recommended prerequisite: WS 350.

## WS 358 - Interventions for Interpers onal 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, emotionaland sexualabuse 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 Interpers onal 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 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 historical and social context. Looks at the historical roots and politicaluses of sexual norms and sexual identities and explores the complexinteractions of race, class, gender, and desire. Finally, looks at some of the current political contests around sexuality.

## WS 361 -Sexual Ass ault (1)

Examines sexual assault fromhistorical, political, and psychological perspectives; the legal and medical systems' responses to sexual assault; and the trauma that results fromrape and theoptions forhealing. Recommended prerequis ite: 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 frominterpers onal violence, draws on resiliency research to understand what fosters healing, explores the role of support systems, altruism, 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 pers pective integrating biology, health and medicine with current and his toricalsocial, cultural and political forces.

Cross-Listedas: This is the same course as Sci 365 U and may be taken only once for credit..

## WS 367 U- War, Sexual Violence and Healing (4)

Addresses various forms and causes of fhuman 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 to combat such violence and facilitatehealing.

## WS 369U- Global Reproductive Justice (4)

This survey course explores movements for reproductive justice within the U.S. and globally. We examine reproductive rights 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 changeover time in the North American context emphas izing the contests involving sexuality beginning with the period of European conquest and ending with looking at HIV/AIDS and transgender issues.

## WS 372U- Topics in Literature, Gender, and Sexuality (4)

Study ofrepresentations of gender and sexuality in literature and related cultural forms. Course may be repeated for up to 8 credits with different topics.

Cross-Listedas: This is the same course as Eng 372U..

## WS 373 - Queer Philosophy (4)

The aim of this course is to illuminate the theoretical underpinnings and theradical epistemological, social, and political possibilities that are afforded by queer philosophy/theory. QueerPhilosophy 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 pers onally political writing, investigate the resonance "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 fromterm to term.

## WS 377U- Topics in FeministS pirituality (4)

Investigation of different forms of feminist spirituality. Topics may includefeminist biblical interpretation, goddesses and spirituality, and ecofeminist 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, aes thetics, 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, performancestudies, and psychology.

Cross-Listed as: This is the same course as Phl379U 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 upperdivision standing.

## WS 381 - Queer of Color Theorizing and Perspectives (4)

Utilizing critical race, feminist, queer, decolonial, and materialist analyses, queer of color theories highlight 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 is sues.
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 Transgender 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 non-profit organizations. Attention to the history of feminist non-profit organizations in the U.S., political and socialstructures that impact such organizations, and decis ion-making and management is sues related to feminist concepts of power. Partnering with a local feminist non-profit, students will gain hands-on knowledge of how feminist organizations strive to put theory into practice.
Prerequis ite: WS 307 or junior standing..

## WS 399 -Special Studies (1-6)

(Credit to be arranged.)

## WS 401 - Res earch (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 407U-Seminar (4)
(Credit to be arranged.)

## WS 409-Practicum(1-12)

(Credit to be arranged.)

## WS 410-Selected Topics (1-6)

(Credit to be arranged.)

## WS 411 - Experiential Learning Seminar (2)

Required during the first termofWS 409 practicum. Serves as a learning community forstudents to presentand reflect on their community-based practicumexperiences. Participants critically assess the contexts in which they are operating and analyze the relationship between critical theory and practice.
Prerequisite:Upper division standing and permission of the instructor.

## WS 412 - Feminist Methodologies (4)

Introduces a range of feminist research methodologies, emphasizing interconnections among race, gender, sexuality, class, dis ability and other aspects of difference. A ssesses knowledge-generating strategies in terms of their suitability for feminist research and addressing power relations. Development of criticalawareness 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 315 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 workshop format where students will be guided through their project with peer and instructor feedback. 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. 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, andclass; and policy issues 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 anti-racist 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 WS 522 and may be taken only once forcredit.. Prerequisite: Familiarity and experience with basic statistical and quantitative data and methods. Instructor permission 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 for credit.

Cross-Listed as: PS 425.

## WS 425-Sociology of Gender (4)

Consideration of the theoretical, methodological, and empirical contributions of currentsociological 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 forcredit. . Prerequisite: juniorstanding.. Cross-Listed as: Soc 425.

## WS 426 - Gender \& Mental Health (4)

Social and historical explanations of, and research on, 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 disorder 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.. Prerequisite: Upper-division standing..Cross-Listed as: Soc 426.

## WS 428 -Lesbian History (4)

Surveys the history of lesbian exis tence in the United States. Begins by asking what "lesbian" means, identifying the different historical markers of female same-sexdesire. Using a rich variety of primary and secondary sources, we analyze his torical attitudes about female same-sexdes ire, follow the emergence of les bian subcultures and communities, examine the development of sexual identities during thetwentieth century, and end by considering les bian issues.

## 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 forcredit.

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-Listedas:This is the same course as Eng 442 and may be taken only once for credit..

## WS 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 criticismand scholarship. This is the same course as Eng 444 and may be taken only once forcredit.

## WS 445-American Women Writers (4)

Study of American women writers, with attention to themes, styles and characteristic concerns, in the light of feminist criticismand 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 affect us. 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 for credit.. Prerequisite: Upperdivision 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 haveon people?s lives, political decisions and social relations. The overall aim is for students to understand how theirown 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 -Feminism and 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 forcredit. . Prerequisite: Upper-divis ion 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: Psy 311 and 3 credits in courses numbered Psy 321 orhigher.

## WS 470U - Asian American Women's Studies (4)

Interdisciplinary course focusing on the contemporary experiences of A sian 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 and bicultural experiences; the politics of language; violence against Asian American women; labor force participation; relationship to feminism; and activism and resistance.

## WS 471 - Trans national Feminis ms (4)

Themes and theoretical principles of transnational feminisms, with special emphasis placed on Third World feminist movements. Themes explored include colonialism, globalization, nationalismand nationbuilding, representation, global economies, and the politics of race, gender, class, sexuality, and nation.

Also offered for graduate-level credit as WS 571 and may be taken only only once for credit. . Prerequisite: WS 301 or WS 315 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) from a social psychological perspective. Strategies for change are considered. Recommended prerequisites: Psy 310 and 3 additional credits in courses numbered Psy 330 orhigher.

## WS 480 - Introduction to Critical Dis ability 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 - Dis ability and Intersectionality (4)

Focuses on intersectionality in the context of disability. Explores the historical and current contexts of dis ability 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 forcredit. . Prerequisite: WS 480 or consent of instructor..

## WS 482 - Topics in Trans national Sexuality

 Studies (4)An examination of how sexualities are understood within a trans national frame of analys is. Topics include the sexual politics of migration, tourismand desire, colonialismand its lingering effects, militarization and sexuality, transnational biopolitics of sexuality, and the politics of globalgay rights discourse.

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 - SelectedTopics (3-4)

(Credit to be arranged.)

## WS 512 - Feminist Methodologies (4)

Introduces a rangeoffeminist research methodologies, emphasizing interconnections among race, gender, sexuality, class, dis ability 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 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 particular economic roles currently and historically. Emphasis on women's responsibility for child rearing and hous ework; 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 anti-racist lenses to evaluatequantitative research applications, including development of research questions; study designs; appropriate use of statistical and other quantitative methods; audience and dis semination 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 WS 422 and may be taken only once for credit.. Prerequisite: Familiarity and experience with basic statistical and quantitative data and methods. CrossListed 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 for credit.

Also offered for undergraduate-level credit as WS 425 and may be taken only once for credit. . Prerequisite:junior standing.. Cross-Listed as: Soc 525.

## WS 526-Gender \& Mental Health (4)

Social and historical explanations of, and research on, 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 Soc 526 and may be taken only once for credit.
Also offered for undergraduate-level credit as WS 426 and may be taken only once for credit.. CrossListed 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 criticismand 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 criticismand 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 affect us.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 repres entations ofgender 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 haveon people's lives, political decisions and social relations. The overall aim is for students to understand how their own culturalidentities affect their media consumption and social positioning. This course is the same as Sp 552 ; coursemay only be taken once for credit.

Cross-Listed as: Comm 552.

## WS 553 - Feminism and 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: Upper-division standing..

## WS 555 - Gender and Education (4)

Explores the significanceofgender in educational work. The focus will be on the history of gender arrangements in educational organizations 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 theexperiences 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 and bicultural experiences; the politics of language; violence against Asian American women; labor force participation; relationship to feminism; and activism and res istance.

## WS 571 - Trans national Feminis ms (4)

Themes and theoretical principles of transnational feminisms, with special emphasis placed on Third World feminist movements. Themes explored include colonialism, globalization, nationalismand nationbuilding, representation, global economies, and the politics of race, gender, class, sexuality, and nation.

Also offered for undergraduate-level credit as WS 471 and may be taken only once for credit. . Prerequisite: WS 301 or WS 315 or consent of instructor. .

## WS 580 - Introduction to Critical Dis ability Studies (4)

Introduction to critical dis ability studies, what it is, and what it is not. Through lectures, readings, guest speakers, assignments and small group dis cussion, 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 ins tructor approval..

## WS 581 - Dis ability and Intersectionality (4)

Focuses on intersectionality in the context of dis ability. 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-level credit as WS 481 and may be taken only once for credit..

## WS 583 - Critical Dis ability Studies Service Learning I (2)

The foci of the 3 quarter sequence are to: prepare students to be culturally responsive change 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 first course in a sequence of three: WS 583, WS 584, WS 585 and must be taken in sequence.

Prerequisite: WS 580, WS 581. .

## WS 584 - Critical Dis ability Studies Service Learning II (2)

The foci of 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 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 Dis ability Studies Service Learning III (2)

The foci of the 3 quarter sequence are to: prepare students to be culturally responsive change 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.


[^0]:    503-725-5511
    www.pdx.edu/admis sions/orientation

[^1]:    Language Education: Required Courses
    Ling 538
    Second Language Acquisition

[^2]:    Geog 590
    GIS Programming
    Geog 575
    Digital Compilation and
    Database Design
    Geog 597 Advanced SpatialQuantitative Analysis

[^3]:    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 reasoning and evidence in science; of the historical development of science and related disciplines; and of the social, cultural, political and ethical contexts of science and technology.
    This interdisciplinary Minor in Science, Technology, and Society requires 24 credits distributed as follows:
    Three core courses ( $\mathbf{1 2}$ credits) chosen from:

    | Hst 387U | History of Modern Science | 4 |
    | :--- | :--- | :--- |
    | NAS 392 | Indigenous Ways of Knowing | 4 |
    | Ph1 470 | Philosophy of Science | 4 |
    | Sci | Science, Gender, and Social | 4 |
    | 347U/WS | Context I |  |
    | 347U |  | 4 |
    | Sci 359U | Biopolitics | 4 |

    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

    ## Controversies

    CS 345
    Cyberculture: The Internetand

[^4]:    $\qquad$

[^5]:    * Students co-enrolled in the Master of Urban and Regional Planning (MURP) programmay substitute USP 540

