



2016 Catalog

How to Use this Catalog

Your Washington State University Catalog provides you with information on a wide variety of important topics. This page shows how you can use the catalog easily.

General Information

The general information section provides you with information about admissions, student services, and choosing a major.

University Common Requirements and Courses

It is important to understand WSU's University Common Requirements (UCOREs), since you must fulfill them in order to graduate. The section of this catalog on the University Common Requirements describes the requirements and lists the courses which fulfill particular UCOREs.

Note: Students pursuing degrees in the College of Arts and Sciences have additional credit hour requirements chosen from UCORE courses as well as foreign language course requirements. Honors College students also have different requirements.

Departments, Requirements, and Courses

The information in this section includes the following:

- A listing of faculty, descriptions of the academic fields, and details about departmental requirements for majors and options, in alphabetical order by department name.
- A complete listing of all requirements needed for each degree is shown in a semester-by-semester schedule of studies to help you plan your course of studies. Note that departmental requirements are set at the time you certify in your major.
- A description of the courses offered by each department. Undergraduate courses are numbered from 100 through 499. 100- and 200-level courses are suggested for first- and second-year students, while 300- and 400-level courses are most appropriate for third- and fourth-year students. Graduate and professional courses are numbered from 500 through 800.

Understanding the Schedule of Studies

Here is an example and explanation of what you will see when you look at a schedule of studies:

First Year

	<i>First Semester</i>	<i>Hours</i>
(1)	Humanities [HUM]	3
(2)	Degree Program Course ¹	3
	Foreign Language, if necessary, or Elective	4
(3)	Quantitative Reasoning [QUAN]	3 or 4
	Social Sciences [SSCI]	3

(1) You are required to take a certain number of University Common Requirement courses (UCOREs) from different areas. In this example, you need to choose a Humanities course. These courses are designated with the [HUM] indicator and both the browse catalog in zsis and the schedule of studies allow you to search by the UCORE course designations such as [HUM]. See the section on the University Common Requirements for more information and a list of the courses.

(2) Footnotes are frequently used to give you more detailed information to help you plan. In this case, the footnote will list the courses from which to choose, given your specific major.

(3) The College of Arts and Sciences requires you to take one year of a foreign language at the university level if two years were not completed at the high school level.

Many departments allow you to take the required courses in a different order. Your advisor can tell you how much flexibility you have in rearranging the courses that are required for your degree.

Understanding Course Descriptions

Below are examples of course descriptions with definitions for each part. **Important!** Prerequisites will be listed if there are courses you need to take before you enroll in any particular class. Course prerequisites are checked by zsis at the point of registration.

In the first example, the course subject, "BIOLOGY", is followed by the course number, and then by "[BSCI]", which indicates that this course meets the UCORE biological science requirement. The credit hours are shown next. This is a 4-credit course, with three hours in lecture and three hours in lab each week. Next are the course prerequisites required for enrolling in the course. If you haven't already taken a CHEM course, you may fulfill the course prerequisite by enrolling in chemistry at the same time that you enroll in BIOLOGY 107.

BIOLOGY

107 [BSCI] Introductory Biology: Cell Biology and Genetics 4 (3-3) Course Prerequisite: Minimum 2 credits 100 level CHEM or concurrent enrollment. First or second semester of a one-year sequence (BIOLOGY 106/107 or BIOLOGY 107/106) for science majors and pre-professional students. Cell biology and genetics of prokaryotes and eukaryotes.

In the second example, this "Topics" course indicates that the subject matter for the class will change each term and that the class may be repeated for additional credit. The course is also a variable credit class, indicated by the 'V' and 3 - 6 credits may be offered or taken each term. Up to 6 total credit hours may be taken. Also, note that the department is recommending that you have Junior standing before taking the course. This is not a course prerequisite -- but it is good advice that you will want to consider.

ANTH

395 Topics in Anthropology V 3-6 May be repeated for credit; cumulative maximum 6 hours. Examination of selected topics in contemporary anthropological theory and practice. Recommended preparation: Junior standing.

WSU Accreditation

Washington State University is accredited by the Northwest Commission on Colleges and Universities. Accreditation of an institution of higher education by the Northwest Commission on Colleges and Universities indicates that it meets 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 reasonable 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 not partial but applies to the institution as a whole. As such, it is not a guarantee of every course or program offered, or the competence of individual graduates. Rather, it provides reasonable assurance about the quality of opportunities available to students who attend the institution.

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

Northwest Commission on Colleges and Universities
8060 165th Avenue N.E., Suite 100
Redmond, WA 98052
(425) 558-4224
www.nwccu.org

Specialized Accreditations

Many programs, departments and colleges are accredited by professional accrediting associations recognized by the Council on Higher Education Accreditation (CHEA) (<http://chea.org>). This information is included in the introductory material of the programs, departments and colleges, and an abbreviated list is provided below.

ABET: Accreditation Board for Engineering and Technology
Accreditation Council for Education in Nutrition and Dietetics
American Animal Hospital Association
AACSB International – The Association to Advance Collegiate Schools of Business
American Association for Assessment and Accreditation of Laboratory Animal Care
American Association of Colleges of Nursing
American Association of Colleges of Pharmacy
American Association of Veterinary Laboratory Diagnosticians
American Chemical Society
American Council for Construction Education
American Council on Pharmaceutical Education
American College of Sports Medicine
American Dietetic Association
American Psychological Association Commission on Accreditation
American Society of Landscape Architects
American Veterinary Medicine Association Council on Education
Commission on Accreditation for Dietetics Education
Commission on Accreditation of Athletic Training Education
Commission on Accreditation of Healthcare Management Education
Commission on Collegiate Nursing Education
Commission on English Language Program Accreditation
Computing Accreditation Commission of ABET
Council for Interior Design Accreditation
Council on Academic Accreditation in Audiology and Speech-Language Pathology
Landscape Architectural Accreditation Board
National Accreditation Commission for Early Care and Education Programs
National Architectural Accrediting Board
National Association of Schools of Music
Washington Professional Educator Standards Board
Washington State Department of Health, Nursing Care Quality Assurance Commission

Academic Calendar

	2016- 2017	2017- 2018	2018- 2019	2019- 2020	2020- 2021	2021- 2022	2022- 2023
First Semester (Fall)							
Classes begin, Monday	Aug 22	Aug 21	Aug 20	Aug 19	Aug 24	Aug 23	Aug 22
Labor Day holiday	Sept 5	Sept 4	Sept 3	Sept 2	Sept 7	Sept 6	Sept 5
Midterm grades due, 5:00 p.m.	Oct 12	Oct 11	Oct 10	Oct 9	Oct 14	Oct 13	Oct 12
Veterans Day holiday	Nov 11	Nov 10*	Nov 12*	Nov 11	Nov 11	Nov 11	Nov 11
Thanksgiving Vacation	Nov 21-25	Nov 20-24	Nov 19-23	Nov 25-29	Nov 23-27	Nov 22-26	Nov 21-25
Commencement	Dec 10	Dec 9	Dec 8	Dec 7	Dec 12	Dec 11	Dec 10
Final Examinations	Dec 12-16	Dec 11-15	Dec 10-14	Dec 9-13	Dec 14-18	Dec 13-17	Dec 12-16
Final grades due, 5:00 p.m.	Dec 20	Dec 19	Dec 18	Dec 17	Dec 22	Dec 21	Dec 20
Second Semester (Spring)							
Classes begin	Jan 9	Jan 8	Jan 7	Jan 13	Jan 11	Jan 10	Jan 9
Martin Luther King, Jr. Day holiday	Jan 16	Jan 15	Jan 21	Jan 20	Jan 18	Jan 17	Jan 16
Presidents Day holiday	Feb 20	Feb 19	Feb 18	Feb 17	Feb 15	Feb 21	Feb 20
Midterm grades due, 5:00 p.m.	Mar 1	Feb 28	Feb 27	Mar 4	Mar 3	Mar 2	Mar 1
Spring Vacation, (10th week)	Mar 13-17	Mar 12-16	Mar 11-15	Mar 16-20	Mar 15-19	Mar 14-18	Mar 13-17
Final Examinations	May 1-5	Apr 30- May 4	Apr 29- May 3	May 4-8	May 3-7	May 2-6	May 1-5
Commencement	May 6	May 5	May 4	May 9	May 8	May 7	May 6
Final grades due, 5:00 p.m.	May 9	May 8	May 7	May 12	May 11	May 10	May 9
Summer Session							
Early Session begins	May 8	May 7	May 6	May 11	May 10	May 9	May 8
Memorial Day holiday	May 29	May 28	May 27	May 25	May 31	May 30	May 29
Eight-Week Session begins	June 5	June 4	June 3	June 8	June 7	June 6	June 5
Late Six-Week Session begins	June 19	June 18	June 17	June 22	June 21	June 20	June 19
Independence Day holiday	July 4	July 4	July 4	July 3*	July 5*	July 4	July 4
Summer Session ends, Friday	July 28	July 27	July 26	July 31	July 30	July 29	July 28
Final grades due, 4:00 p.m.	Aug 1	July 31	July 30	Aug 4	Aug 3	Aug 2	Aug 1

* Observed

Please note: Academic advising and registration for continuing students will be held prior to the end of the previous term.



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Washington State University

www.wsu.edu

At Washington State University, scholars are driven by a common passion: making the world a better place. That commitment—passed along from one generation of Cougar alumni to the next—reflects a deeply held university belief that an informed intellect, combined with a confident, can-do spirit, can improve the quality of life for us all.

You'll see that principle in action every day at WSU. It's evident among students, who volunteer for 78,000 hours of community service in a typical year. It permeates teaching and research, which address problems in areas like health, food, energy, sustainability, national security, and social opportunity. And it's reflected throughout the diverse campus community, which encourages members to invest their time and talents in academic and civic activities.

Learn by doing

At WSU, hands-on learning is a given. Students work side-by-side with professors whose scholarship and research is discussed globally. Many undergraduates enter national competitions in areas as varied as robotics, clean energy, mock trial, interior design, and business. Others present papers at conferences and publish their findings in scholarly journals.

International emphasis

WSU strives to deepen students' understanding of the global community. Students can choose from more than 1,500 study abroad programs in 86 countries. Some 1,700 international students add a rich layer of cultural diversity to the main WSU campus in Pullman. The Honors College curriculum immerses students in the study of international issues.

Outstanding academic programs at all levels

Undergraduate students can choose from 200-plus fields of study. Many academic programs rank among the nation's best. Among them is the Edward R. Murrow College of Communication, where students gain practical experience at student-run television and radio stations. Students in the organic agriculture major, the first program of its kind in the nation, roll up their sleeves to work on a four-acre certified organic teaching farm. In the Carson College of Business, hospitality business management students study overseas to master cross-cultural communication and management principles.

Graduate students from around the world enroll in WSU's 76 master's and 64 doctoral programs. Among top-rated offerings are chemical engineering and bioengineering, crop and soil sciences, English, health policy and administration, interior design, MBA, molecular biosciences, physics, the plant sciences, radiochemistry, zoology, and veterinary sciences.

In the health sciences WSU offers undergraduate and graduate programs in nursing, as well as professional degrees in pharmacy, and veterinary medicine. At the WSU Health Sciences Campus in Spokane, The Elson S. Floyd College of Medicine is working to secure national accreditation for WSU's new medical school.

Commitment to sustainability

WSU's dedication to sustainability reaches into every corner of campus life. New construction meets national green building standards. Faculty research addresses the threats of energy supply, climate change, pollution, and resource depletion. Students contribute to a fund that supports campus sustainability projects. An automated bike-sharing program—the first of its kind in the nation at a college campus—lets students, faculty, and staff borrow bikes for free. And campus-wide collection bins make recycling effortless.

Ongoing improvements for students

WSU continually adds amenities that directly benefit students. Recent examples include a revitalized student union building, new residence halls, and a major expansion of the Pac-12 Cougars' football stadium. An award-winning Student Recreation Center inspires students to maintain optimum health. It provides ready access to cardio and weight equipment, courts for basketball, volleyball, and badminton, an indoor rock climbing wall, and a swimming pool and spa.

Statewide and worldwide reach

WSU's flagship campus lies in Pullman, a quintessential college town in southeastern Washington. Cougar spirit permeates life on and off campus for

more than 20,000 students. The University has thriving regional campuses in Spokane, the Tri-Cities, and Vancouver. It also offers degree programs in Everett. A Global Campus with nationally recognized online learning programs enrolls students worldwide.

Degrees Granted

Accounting, MAcc
Agricultural Economics, PhD
Agricultural and Food Systems, BS
Agriculture, MS
American Studies, MA, PhD
Animal Sciences, BS, MS, PhD
Anthropology, BA, MA, PhD
Apparel, Merchandising, and Textiles, BA, MA
Applied Economics, MS
Architectural Studies, BS
Architecture, MArch
Asian Studies, BA
Athletic Training, BS
Biochemistry, BS
Bioengineering, BS
Biological and Agricultural Engineering, MS, PhD
Biology, BS, MS, PhD
Business Administration, BA, MBA, PhD
Chemical Engineering, BS, MS, PhD
Chemistry, BS, MS, PhD
Civil Engineering, BS, MS, PhD
Communication, MA, PhD
Communication and Society, BA
Comparative Ethnic Studies, BA
Computer Engineering, BS, MS
Computer Science, BA, BS, MS, PhD
Construction Engineering, BS
Construction Management, BS
Coordinated Program in Dietetics, Nutrition, and Exercise Physiology, MS
Criminal Justice, BA, MA, PhD
Crop Science, MS, PhD
Data Analytics, BS
Digital Technology and Culture, BA
Earth and Environmental Science, BS
Economics, PhD
Economic Sciences, BS
Education, BA, EdM, MA, MIT, EdD, PhD
Electrical and Computer Engineering, PhD
Electrical Engineering, BS, MS
Electrical Power Engineering, PSM
Engineering, MS
Engineering and Technology Management, METM
Engineering Science, PhD
English, BA, MA, PhD
Entomology, MS, PhD
Environmental Engineering, MS
Environmental and Natural Resource Sciences, PhD
Environmental Science, MS
Fine Arts, BA, BFA, MFA
Food Science, BS, MS, PhD
Foreign Languages and Cultures, BA, MA
Genetics and Cell Biology, BS
Geology, MS, PhD
Health Policy and Administration, MHPA
History, BA, MA, PhD
Horticulture, MS, PhD
Hospitality Business Management, BA
Human Development, BA
Humanities, BA
Individual Interdisciplinary, PhD
Integrated Plant Sciences, BS
Interior Design, BA, MA
Journalism and Media Production, BA
Kinesiology, BS
Landscape Architecture, BLA, MS
Materials Science and Engineering, BS, MS, PhD
Mathematics, BS, MS, PhD
Mechanical Engineering, BS, MS, PhD
Microbiology, BS
Molecular Biosciences, MS, PSM, PhD
Molecular Plant Sciences, MS, PhD
Music, BA, BMus, MA
Natural Resource Sciences, MS
Neuroscience, BS, MS, PhD
Nursing, BS, MNurs, DNP, PhD
Nutrition and Exercise Physiology, BS, MS, PhD
Pharmaceutical Sciences, MS, PhD
Pharmacy, PharmD
Philosophy, BA
Physics, BS, MS, PhD
Plant Biology, MS, PhD
Plant Pathology, MS, PhD
Political Science, BA, MA, PhD
Prevention Science, MS, PhD
Psychology, BS, MS, PhD
Public Affairs, BA, MPA
Science, Bachelor of Social Sciences, BA
Social Studies, BA
Sociology, BA, MA, PhD
Software Engineering, BS, MS
Soil Science, MS, PhD
Speech and Hearing Sciences, BA, MS
Sport Management, BA
Statistics, MS
Strategic Communication, BA, MA
Veterinary Medicine, DVM
Veterinary Science, BS, MS, PhD
Women's Studies, BA
Zoology, BS

WASHINGTON STATE UNIVERSITY STRATEGIC PLAN

Vision

Washington State University will be one of the nation's leading land-grant universities, preeminent in research and discovery, teaching, and engagement.

Mission

Washington State University is a public research university committed to its land-grant heritage and tradition of service to society. Our mission is threefold:

- To **advance** knowledge through creative research, innovation, and creativity across a wide range of academic disciplines.
- To **extend** knowledge through innovative educational programs in which students and emerging scholars are mentored to realize their highest potential and assume roles of leadership, responsibility, and service to society.
- To **apply** knowledge through local and global engagement that will improve quality of life and enhance the economy of the state, nation, and world.

Values

- **Quality and Excellence:** We are committed to providing quality and excellence in all our endeavors.
- **Integrity, Trust, and Respect:** We are committed to ensuring trust and respect for all persons in an environment that cultivates individual and institutional integrity in all that we do.
- **Research, Innovation, and Creativity:** We are committed to the pursuit of inquiry and discovery and to the creation and dissemination of knowledge.
- **Land-grant Ideals:** We are committed to the land-grant ideals of access, engagement, leadership, and service to bring the practical benefits of education to the state, nation, and global community.
- **Diversity and Global Citizenship:** We embrace a worldview that recognizes and values the importance of domestic and global diversity, global interdependence, and sustainability.
- **Freedom of Expression:** We are committed to the free exchange of ideas in a constructive and civil environment, including the canons of academic freedom in research, teaching, and outreach.
- **Stewardship and Accountability:** We are committed to serving as ethical and responsible stewards of University resources.

Goals

Theme 1: Exceptional Research, Innovation, and Creativity

Goal 1

Increase productivity in research, innovation, and creativity to address the grand challenges and opportunities of the future.

Goal 2

Further develop WSU's unique strengths and opportunities for research, innovation, and creativity based on its locations and land-grant mandate to be responsive to the needs of Washington state.

Goal 3

Advance WSU's reach both nationally and internationally in existing and emerging areas of achievement.

Theme 2: Transformative Student Experience

Goal 1

Provide an excellent teaching and learning opportunity to a larger and more diverse student population.

Goal 2

Provide a university experience centered on student engagement, development, and success, which prepares graduates to lead and excel in a diverse United States and global society.

Goal 3

Improve curricular and student support infrastructure to enhance access, educational quality, and student success in a growing institution.

Theme 3: Outreach and Engagement

Goal 1

Increase access to and breadth of WSU's research, scholarship, creative, academic, and extension programs throughout Washington and the world.

Goal 2

Expand and enhance WSU's engagement with institutions, communities, governments, and the private sector.

Goal 3

Increase WSU faculty, staff, and students' contributions to economic vitality, educational outcomes, and quality of life at the local, state, and international levels.

Theme 4: Institutional Effectiveness: Diversity, Integrity, and Openness

Goal 1

Create and sustain a university community that is diverse, inclusive, and equitable.

Goal 2

Cultivate a system-wide culture of organizational integrity, effectiveness, and openness that facilitates pursuit of the institution's academic aspirations.

Goal 3

Steward and diversify resources invested by students, the public, and private stakeholders in a responsible way to ensure economic viability of the institution.

For more details on WSU's Strategic Plan, visit <http://strategicplan.wsu.edu>.

WASHINGTON STATE UNIVERSITY FOUNDATION

WSU Foundation, 800-448-2978

Town Centre, Suite 301

PO Box 641925, Pullman, WA 99164-1925

<http://foundation.wsu.edu>

The mission of the Washington State University Foundation is to promote, accept, and maximize private support for programs, initiatives, and properties of Washington State University and its urban campuses. The WSU Foundation also prudently manages, invests, and stewards the assets entrusted to it by WSU and its alumni, friends, and donors. Since its creation in 1979, the WSU Foundation has raised approximately \$1.6 billion in private gifts and grants in support of WSU's world-class educational experience, research, and community outreach. The Foundation successfully completed the \$1 billion *Campaign for Washington State University: Because the World Needs Big Ideas* on June 30. Private contributions to the WSU Foundation fund scholarships for deserving undergraduate and graduate students, attract and retain top faculty, build state-of-the-art facilities, and enable cutting-edge research and educational programs to flourish at Washington State University. For more information, visit the WSU Foundation's web site or e-mail: foundation@wsu.edu. Mail inquiries may be addressed to WSU Foundation, PO Box 641925, Pullman, WA 99164-1925.

Student Services and Facilities

Academic Success and Career Center (ASCC)

Lighty Building, Rooms 160 - 180
509-335-6000, or 888-978-7252
<https://ascc.wsu.edu>

The Access Center

Disability Resource Services
Washington Building, Room 217
509-335-3417
<http://accesscenter.wsu.edu>

Center for Civic Engagement

Compton Union Building (CUB), Room L45/L48
509-335-7708
<http://cce.wsu.edu>
ccc@wsu.edu

Cougar Card Center

Compton Union Building (CUB), Room 60
509-335-CARD (2273)
<http://cougarcard.wsu.edu>
cougarcard@wsu.edu

WSU Children's Center

1425 NE Olympic Ave
509-335-8847
<http://childrenscenter.wsu.edu>
childrens.center@wsu.edu

Compton Union Building (CUB)

Student Union
Information Desk
509-335-8426
<https://cub.wsu.edu>

Counseling and Psychological Services

Washington Building, Room 302
1125 NE Washington Ave.
Counseling: 509-335-4511
Testing: 509-335-1744
After hours crisis: 509-335-2159
<https://counsel.wsu.edu>

Office of the Dean of Students

Student Assistance Programs
French Administration Building, Room 134
509-335-5757
<http://deanofstudents.wsu.edu>
deanofstudents@wsu.edu

Dining Services

509-335-5498
<http://dining.wsu.edu>

The Office of Equal Opportunity

French Administration Building, Room 225
509-335-8288
<https://oeo.wsu.edu>

Gender Identity/Expression and Sexual Orientation Resource Center

Compton Union Building (CUB), Room 401
509-335-8841
<http://thecenter.wsu.edu>
giesorc@wsu.edu

Health and Wellness Services

Washington Building, 1st Floor
1125 NE Washington Ave.
Medical Clinic 509-335-3575; Pharmacy 509-335-5742;
Vision Clinic 509-335-0360
Insurance: see Student Medical Insurance below.
<https://hws.wsu.edu>
hws@wsu.edu

Housing and Residential Life

Streit-Perham Administrative Suite
509-335-7732
<http://housing.wsu.edu>

Information Technology Services (ITS)

ITS Services & Accounts Desk
CUE 302
509 335-4357; 1-800-608-3839
<https://infotech.wsu.edu>
cougtech@wsu.edu

International Programs

Bryan Hall, Room 206
509-335-2541
<https://ip.wsu.edu>
ip.admin@wsu.edu

Intensive American Language Center (IALC)

Kruegal Hall, Room 13
509-335-6675
<https://ip.wsu.edu/ialc>
ialc@wsu.edu

The Libraries

509-335-9671
<http://www.libraries.wsu.edu>

Multicultural Student Services

Compton Union Building (CUB), Room 409
509-335-7852
<http://mss.wsu.edu>

The Ombudsman Office

Wilson-Short Hall, Room 2
509-335-1195
<https://ombudsman.wsu.edu>
ombudsman@wsu.edu

Registrar's Office

French Administration Building, Room 346
509-335-5346
<http://registrar.wsu.edu>
registrar@wsu.edu

Student Accounts (Tuition and Fees)

French Administration Building, Room 342
509-335-9651
<http://studacct.wsu.edu>
univ-receivables@wsu.edu

Student Entertainment Board

Compton Union Building (CUB), Room 304
509-335-3503
<http://seb.wsu.edu>
seb.director@wsu.edu

Student Financial Services

Financial Aid and Scholarship Services
Lighty Building, Room 380
509-335-9711
<https://finaid.wsu.edu>

Student Government

Undergraduate Students - ASWSU:
509-335-9591
<http://aswsu.wsu.edu>
Graduate and Professional Students - GPSA:
Compton Union Building (CUB), Room 308
509-335-9545
<http://studentinvolvement.orgsync.com/org/gpsa>

Student Involvement

CUB 320
509-335-9667
<http://studentinvolvement.wsu.edu>

Student Medical Insurance

Washington Building, Room 133
1125 NE Washington Ave.
Claims and Benefits 509-335-3575, ext 3;
Enrollment 509-335-5834
<https://studentinsurance.wsu.edu>
student.insurance@wsu.edu

Student Recreation Center

Student Recreation Center, Room 250
509-335-8732 (UREC)
<http://urec.wsu.edu>

Student Support Services TRIO Program

Lighty Building, Room 260
509-335-7324
<http://sssp.wsu.edu>

Summer Session

Pullman:
509-335-2238
<https://summer.wsu.edu>
Spokane:
Student Affairs: 509-358-7978
Tri-Cities:
509-372-7250
<http://tricities.wsu.edu/summer/>
Vancouver:
360-546-9779
<https://studentaffairs.vancouver.wsu.edu/admissions/summer-classes>

Transfer Clearinghouse

Lighty Building, Room 190
509-335-8704
<https://transfercredit.wsu.edu>

Office of Veterans Affairs

Federal Veterans Benefits
Holland Library, Room 120BA
509-335-1234;
<http://va.wsu.edu>
veterans@wsu.edu

The Writing Program

Smith Center for Undergraduate Education (CUE), Room 305
509-335-7959
<https://writingprogram.wsu.edu>
Information includes:
Writing Placement Process
Junior Writing Portfolio
The Writing Center

Women's Resource Center

Wilson-Short Hall, Room 8
509-335-6849
<http://women.wsu.edu>

Admission

Lighty Building, Room 370
888-468-6978 or 509-335-5586

<http://admission.wsu.edu/>

General Information

Admission to Washington State University is granted without regard to age, sex, race, religion, color, creed, handicap, national or ethnic origin, or marital status. Admission to the University is granted to eligible applicants based on space availability, prior to registration but not after census day for each semester.

The following information relates to admission of new students only. It is not applicable to students previously enrolled in Washington State University during the regular school year.

It is the practice of Washington State University to admit all applicants if the total evidence indicates a reasonable probability of success. The total number of new students admitted for any one semester or in any specific department or program will be based on the number of students for whom facilities and resources can be made available.

Applications are available at apply.wsu.edu or from the Office of Admissions, PO Box 641067, Pullman, WA 99164-1067.

Applicants must apply with a full and complete application packet by January 31 for priority consideration for the fall semester, as space is limited. Applicants for spring semester should apply by November 15 for priority consideration. Applications submitted after census day of classes will not be considered.

Any freshman applicant planning to compete in intercollegiate athletics must submit scores on the College Board SAT to meet National Collegiate Athletic Association (NCAA) regulations.

The University reserves a limited number of spaces in the incoming class for students with exceptional talent or potential, as determined by the departmental/college representative making the recommendation.

Students who fail to meet the published admission requirements may contact the Office of Admissions for further information. Exceptions to the admission requirements may be made only by the Faculty Admissions Subcommittee.

Retention of Students

The grade point average for first-year students entering from high school in the fall semester 2015 was 3.32 (all campuses). Of the 4,727 first-year students who entered in the fall 2015, 4,297 were enrolled in the spring of 2016.

Freshman Admission Requirements

<http://admission.wsu.edu/>

Freshman applicants will be considered for admission on the basis of their academic records and other supporting documents, which include transcripts that show coursework through at least grade 11, completion of the College Academic Distribution Requirements (CADRs), test scores (ACT or SAT), and other relevant materials as requested. See Academic Regulation 2.

It is strongly recommended for students planning to major in science or science-related fields to complete at least three years of science.

Applicants who have not graduated from high school at the time of application must maintain a satisfactory record, complete all required courses specified for admission to WSU, and provide evidence of graduation, higher credential such as an Associate of Arts or Associate of Science degree, or completion of the GED prior to enrollment. See Academic Regulation 1a. WSU reserves the right to withdraw an offer of admission if there is a significant drop in the applicant's academic performance following the offer of admission or if a student does not complete the CADRs as outlined above.

A complete application includes the freshman application form, the official high school transcript provided directly from the high school, the ACT or SAT score report from the testing agency, and the nonrefundable application fee. Students are encouraged to apply online at apply.wsu.edu.

Factors considered in freshman admission include grade point average, standardized test scores, the strength of the high school course work (including senior year course work), grades the student has earned, and any improvements they have made in their academic performance. Although letters of recommendation are not required, they are taken into consideration if they

are helpful in speaking to the student's academic potential and abilities. Refer to the website for additional information.

Students interested in the Honors College should email honors@wsu.edu or call 509-335-4505.

Advanced Placement (AP), College Level Examination Program (CLEP), International Baccalaureate (IB), and Cambridge International Examinations

<http://admission.wsu.edu/requirements/credit.html>

See Academic Regulation 15 and Academic Regulation 6c.

Transfer Admission Requirements

<http://admission.wsu.edu/transfer/>

Overall academic preparation, including cumulative grades as well as grade trends are factors in the admission process for all students. See Academic Regulation 4.

Transfer Credit Policy

See Academic Regulation 6.

Associate Degree Transfer

See Academic Regulation 6.

Adult Student Admission

<http://admission.wsu.edu>

Washington State University recognizes that students who have been away from the classroom for extended periods of time may have special needs. Therefore, in accordance with the policies set forth by the Washington Student Achievement Council, applications from students who are 25 years of age or over may be considered for admission on the basis of alternative criteria. Students are encouraged to contact the Office of Admissions for details.

Admission of Students with Extraordinary Talents

Washington State University wishes to make educational opportunities available to students whose extraordinary talents have the potential to enrich our intellectual, cultural, and social environments, but whose overall academic credentials may not qualify them for regular admission.

WSU departments, colleges, or programs may request special consideration for students who possess such extraordinary talents provided the talent is of a nature that would not normally be reflected or assessed during the regular admission process. The current admission process considers the curriculum, grades, and standardized scores of the applicant. Examples of evidence of extraordinary talents that might not be apparent in the applicant's file include: exceptional music, athletic accomplishment, awards in science, math, or artistic competitions or similar measures of talent.

There are two tracks for admission under this policy. The first admits students who are minimally qualified with an AIN of 28 or above, but whose index scores do not meet the criteria set by the University for admission that year. Such students may be admitted upon the written recommendation of the chair/director of the relevant academic department, school, or program or the head coach of the relevant athletic team and the approval of the Vice President for Student Affairs and Enrollment or designees. In the case of student athletes, the concurrence of the Faculty Athletic Representative is also required. Letters of recommendation must detail how the student's skills will contribute to the University.

A three-person panel consisting of the Chair of the Faculty Senate, Chair of the Academic Affairs Committee of the Faculty Senate, and the Vice President for Student Affairs and Enrollment, or designees will further review students identified as having extraordinary talent but whose AIN scores are below a 28. A written recommendation of the relevant chair/director or head coach will be required to support the student's admission. In the case of student athletes, the students who are assessed to have potential to contribute to the University

through their special skills and advance themselves through the university experience will be considered for admission. Students who fail to meet the university's minimum core requirements or in the case of student athletes who fail to meet NCAA requirements will not be admitted to the university under this policy.

The University will carefully monitor the number and progress of students admitted under rules 1-c and 1-e. Every fall, the Vice President for Student Affairs and Enrollment will provide a written report to the Provost, Chair of the Faculty Senate, and the President on the number of students admitted, their academic qualifications, extraordinary talents, or the basis for their admission. The report will also assess the academic progress of students previously admitted under these rules to insure that the program is functioning to the advantage of the students and the university community as a whole.

Admission to WSU Spokane, WSU Tri-Cities, and WSU Vancouver, Global Campus, and WSU North Puget Sound at Everett

<http://spokane.wsu.edu/>

<http://tricities.wsu.edu/>

<http://www.vancouver.wsu.edu/>

<http://globalcampus.wsu.edu/>

<http://everett.wsu.edu/>

Former Students Returning (FSR) Not Enrolled the Previous Academic Semester

<http://admission.wsu.edu>

If you previously enrolled at any Washington State University campus and you were absent for more than one semester (excluding summer), you are considered a former student and you need to reapply for admission.

FSR applicants will be granted admission if they are in good academic standing. FSR applicants whose previous academic record at Washington State University is unsatisfactory will be required to follow established academic reinstatement procedures (see <http://ascc.wsu.edu>) prior to admission. Applications submitted after census day of classes will not be considered.

FSR applicants who have attended other institutions since their last enrollment at Washington State University are required to submit an official transcript directly from each institution attended. Applicants will be considered for admission on the basis of their academic records and other supporting documents which include post-secondary transcripts, grade trends, strength of curriculum and academic preparation.

Apply at <http://apply.wsu.edu> or contact the Office of Admissions for a FSR application.

International Student Admission Requirements

<http://ip.wsu.edu/apply/admission-requirements.html>

Non-Degree Admission

<http://admission.wsu.edu>

Individuals may enroll at Washington State University as non-degree students for personal enrichment, professional development, or other reasons. Enrollment in courses for non-degree students is limited to space availability, and non-degree students register for courses after degree-seeking students. Financial aid is not available for non-degree students. Students who are interested in applying as a non-degree-seeking student may apply at <http://apply.wsu.edu>.

International Student Non-Degree Admission Requirements

<http://ip.wsu.edu/apply/admission-requirements.html>

Running Start at the Pullman campus

For fall and spring semesters, eligible Whitman County high school students may enroll through Running Start. For more information on the Running Start program, please contact the Registrar's Office at 509-335-1693.

Limited Enrollment Programs

Since academic departments may establish additional requirements for admission or certification to specific programs, eligibility for admission to Washington State University does not ensure acceptance into any department or program as a certified major and degree candidate. Several academic programs are unable to accept all interested students. In these situations, and others which may arise in the future, the most highly qualified students will be selected up to the enrollment limits in the specific programs. Details for certification and acceptance into programs vary and students applying for admission to selective programs should contact the program or check its website or catalog section for more information.

Advance Payment on Tuition and Fees

<https://wsu.edu/advancepay>

All new admitted undergraduate students, except former students returning and non-degree students are required to submit a nonrefundable advance payment on tuition and fees in the amount of \$200 to confirm their space at the University. Students must submit this fee by the due date in their admission letter otherwise their space may be given to another student.

Graduate Admission Requirements

<http://gradschool.wsu.edu>

Colleges

To see a complete listing of all undergraduate degrees, majors, and options within the major, as well as all undergraduate minors and certificates, please see the Achieving Academic Success section of this catalog.

COLLEGE OF AGRICULTURAL, HUMAN, AND NATURAL RESOURCE SCIENCES

Ron Mittelhammer, Dean
Hulbert Hall, Room 421
509-335-4561

<http://cahnrs.wsu.edu>

Recognizing its unique land-grant research and educational mission to serve Washington State and the global community, the College of Agricultural, Human, and Natural Resource Sciences is discovering and sharing knowledge through excellence in research, instruction, and statewide Extension programs. Students, scientists, and educators contribute to securing a safe, abundant food and fiber supply; promoting the well-being of individuals, families, and communities; enhancing the sustainability of agricultural and economic practices and the environment; and promoting stewardship of natural resources and ecological systems.

The college offers approximately 20 majors to prepare professionals for careers through departments including Animal Sciences; Apparel, Merchandising, Design, and Textiles; Crop and Soil Sciences; Economic Sciences; Entomology; Environment; Food Science; Horticulture; Human Development; Interior Design; Landscape Architecture; and Plant Pathology. Students receive a solid foundation in the sciences with a technological grounding that enables them to explore and stay up-to-date with the relevant, dynamic fields of agricultural, human, economic, and natural resource sciences. All degree programs provide students with opportunities for hands-on interactions in their field, whether it's working with researchers in classrooms/labs or through internships and international study abroad programs.

Overall, the agricultural industry remains Washington's number one thriving economic industry and supports a vibrant job market. Programs in agriculture prepare students for a wide variety of careers in science; education; agriculture and food security; fruit and vegetable management; agricultural technology and production management; biotechnology; field crop management; turfgrass management; organic agriculture; landscape, nursery, and greenhouse management; viticulture and enology; business and finance; economics; food processing; and sales and distribution of food products.

In addition, programs offered through the college's newly formed School of the Environment prepare students for careers in earth sciences, environmental and ecosystem sciences, and wildlife ecology and conservation sciences. Graduates enter their profession as agricultural producers, land managers, agriculture teachers, landscape architects, food scientists, winemakers, or industry representatives for agriculture, natural resources, and retail operations. Students who earn graduate degrees follow scientific careers in research; teaching university classes; Extension education; and highly technical pursuits within industry and government organizations.

The College of Agricultural, Human, and Natural Resource Sciences also offers unique opportunities for students pursuing careers in veterinary medicine. Animal Sciences and Natural Resource Sciences both allow students to build a foundation for veterinary school and earn a baccalaureate degree simultaneously.

Programs in the human sciences prepare students for positions as teachers of family and consumer sciences, human science and community agency managers, and directors of aging programs. Other careers include apparel design and merchandising, interior design, consumer services, or commercial food service. Students who graduate are prepared to teach in public schools, to work in adult education, and to administer and supervise preschool and child care centers. Those who earn advanced degrees fill positions in research, Extension, governmental agencies, foreign services, college teaching, and businesses around the world.

Admission

The requirements for admission to the College of Agricultural, Human, and Natural Resource Sciences are the same as those for Washington State University. High school students planning to enroll in the college are urged to work closely with their counselors and with representatives from WSU in developing an appropriate background of high school courses in biological, physical, and social sciences, mathematics, and other elective areas.

Transfer Students

Most transfer students who have completed one year in another college or university ordinarily will have no difficulty in completing the requirements for one of the bachelor's degrees in three additional years.

Students enrolled in other colleges or universities but planning to transfer to the College of Agricultural, Human, and Natural Resource Sciences should concentrate as much as possible on general education, science, and other departmental requirements normally scheduled during the first and second years, with particular attention to those subjects required for the intended majors. In addition, students should also contact a College of Agricultural, Human, and Natural Resource Sciences academic advisor in their area of interest.

Students at community colleges in the state should check to see whether there is an articulation agreement between their institution and the WSU program of interest in order to simplify the transition to WSU.

Requirements for Graduation

Requirements for graduation in the College of Agricultural, Human, and Natural Resource Sciences vary according to the major and the degree to be granted, as described in the departmental sections of this catalog. The student and the advisor jointly have the responsibility of selecting courses to fit the student's native ability and professional interests, consistent with departmental and general education requirements. Students are encouraged to do more than satisfy the minimum requirements.

Agricultural, Human and Natural Resource Sciences Degrees

Degree	Academic Area
Bachelor of Science	
Agricultural and Food Systems	CAHNRS Academic Programs
Animal Sciences	Animal Sciences
Economic Sciences	Economic Sciences
Earth and Environmental Sciences	Environment
Food Science	Food Science
Integrated Plant Sciences	Crop and Soil Sciences Horticulture
Bachelor of Arts	
Apparel, Merchandising, and Textiles	Apparel, Merchandising, Design, and Textiles
Human Development	Human Development
Interior Design	Design and Construction
Bachelor of Landscape Architecture	
Landscape Architecture	Design and Construction
Master of Science	
Agriculture	CAHNRS Academic Programs
Animal Sciences	Animal Sciences
Applied Economics	Economic Sciences
Biological and Agricultural Engineering	Biological Systems Engineering
Crop Science	Crop and Soil Sciences
Entomology	Entomology

Environmental Sciences	Environment
Food Science	Food Science
Geology	Environment
Horticulture	Horticulture
Molecular Plant Sciences	Molecular Plant Sciences
Natural Resource Sciences	Environment
Plant Pathology	Plant Pathology
Prevention Science	Human Development
Soil Science	Crop and Soil Sciences
Master of Arts	
Apparel, Merchandising, and Textiles	Apparel, Merchandising, Design, and Textiles
Interior Design	Design and Construction
Doctor of Philosophy	
Agricultural Economics	Economic Sciences
Animal Sciences	Animal Sciences
Biological and Agricultural Engineering	Biological Systems Engineering
Crop Science	Crop and Soil Sciences
Economics	Economic Sciences
Entomology	Entomology
Environmental and Natural Resource Sciences	Environment
Food Science	Food Science
Geology	Environment
Horticulture	Horticulture
Molecular Plant Sciences	Molecular Plant Sciences
Plant Pathology	Plant Pathology
Prevention Science	Human Development
Soil Science	Crop and Soil Sciences

COLLEGE OF ARTS AND SCIENCES

Daryll B. DeWald, Dean
Thompson Hall, Room 309
509-335-4581
<http://cas.wsu.edu>

The College of Arts and Sciences fosters an open and diverse environment where faculty and students engage in wide-ranging research as well as artistic creativity, humanistic inquiry, global learning, and community involvement. Covering disciplines within the arts, humanities, life sciences, physical sciences, and social sciences, undergraduate and graduate academic programs provide students with a broad and deep understanding of culture, society, and human behavior as well as with a sound and challenging education. Students in the college are inspired to become critical thinkers and life-long learners, prepared for a rich and rewarding life in a wide range of careers or for further graduate and professional education.

Both undergraduate and graduate degree programs within the college include classroom instruction, seminars, special projects, and research, which together provide first-rate training to meet the demands of our diverse technological and global society. It also provides leadership skills development opportunities through its student ambassador program and over forty registered student organizations, and promotes career-skill development through internships and other experiential learning options. In addition, one of the major functions of the college is to provide foundational course work for students majoring in other disciplines.

Many of the college's faculty have attained national and international reputations and have received numerous honors and awards. These include the American Association for the Advancement of Science Fellowships, American Chemical Society Fellowships, American Physical Society Fellowships state and national teaching awards, Guggenheim Fellowships, Fulbright Scholarships, National Endowment for the Humanities Fellowships, American Council of Learned Societies Fellowships, national career development awards, National Institutes of Health Merit Awards, and an Eli Lilly Award. Faculty frequently serve on national review panels of granting agencies for instructional and research support and on editorial boards of international journals.

Many undergraduate majors conduct research and creative projects under supervision of a faculty member. These hands on opportunities are facilitated by the high quality of the teaching and research laboratories, computer facilities, music and arts studios, museums, and other infrastructure within the college. The Franceschi Microscopy and Imaging Center, Nuclear Magnetic Resonance Center, Geoanalytical Laboratory, Ownbey Herbarium, Conner Zoological Museum, Museum of Anthropology, Hudson Biological Reserve, and Meyer's Point Biological Study Site are all facilities within the college. A strong technical services unit provides instrument shops, electronics construction and repair, and graphics.

Major natural science research areas in the college include shock physics, molecular and atomic interactions on surfaces, continuum mechanics, avian environmental physiology, regulation of cellular growth and differentiation, photosynthesis, mechanisms of chemical reactions, biological evolution and ecology, environmental remediation, mathematical modeling of biological and physical processes, numerical analysis, reliability and fatigue studies, resource management, protein synthesis and export, chemotaxis, coevolution of plants and animals, and reproductive biology.

Well-recognized scholars in the social sciences and humanities are making significant contributions in the fields of environmental studies and peace and security. Researchers and students in the humanities and social sciences are identifying the personal and sociopolitical factors that influence chronic diseases and other threats to health, including substance abuse, accidents, and high-risk behaviors. The research and creative activity of humanities scholars, musicians, artists, and social scientists throughout the college fosters mutual understanding and cooperation across cultures and nations, building partnerships with diverse communities—from the cultures of the Pacific Rim to Native American and Latino cultures closer to home.

Many programs within the college offer graduate degrees that further prepare students for successful professional and academic careers. Undergraduate students planning to pursue advanced work in graduate or professional schools are advised to plan curricula to meet admission requirements for advanced study. A number of programs in the college are externally accredited. The doctoral program in clinical psychology is accredited by the American Psychological Association and the Music Program is a full member of the National Association of Schools of Music, for example.

The college, in cooperation with the Department of Teaching and Learning, prepares teachers for all levels of educational work. Students preparing for teaching at the elementary, secondary, and college levels usually complete the course work in their chosen subject-matter field within the College of Arts and Sciences. The specific requirements for certification and teaching majors and minors for K-12 teachers are listed under the Department of Teaching and Learning.

The College also oversees the Health Professions Student Center and the Pre-Law Resource Center, which serve all university students interested in pursuing these careers. It also provides health-related or pre-law curricula in units such as the School of Biological Sciences or departments and programs such as chemistry, comparative ethnic studies, English, history, philosophy, and sociology.

Admission

The general requirements for admission to the College of Arts and Sciences are the same as those for Washington State University. Some departments have selective admissions criteria requiring demonstration of artistic achievement and/or completion of specific courses with specific grades prior to certification of the respective major.

High school students should include the following subjects as preparation for work in the college: at least four years of English, at least two years of one foreign language, three years of mathematics, two years of science, and three years of social sciences; participation in music, art, and speech.

Requirements for Graduation

Graduation requirements for a bachelor's degree include the University General Education Requirements (for students admitted prior to Fall 2012) or the University Common Requirements (admitted beginning Fall 2012) plus additional College of Arts and Sciences requirements in arts and humanities, social sciences, and sciences. Each academic department or program has additional graduation requirements which are included in the departmental descriptions in this catalog.

Degrees

The College of Arts and Sciences offers programs of study leading to the following degrees:

Degree

Academic Area

Bachelor of Arts

Anthropology
Asian Studies
Comparative Ethnic Studies

Criminal Justice and Criminology
Digital Technology and Culture
English
Fine Arts
Foreign Languages and Cultures
(Chinese, French, Japanese, Spanish)
History
Humanities
Music
Philosophy

Political Science

Public Affairs (Vancouver campus)

Social Sciences
Social Studies
Sociology
Women's Studies

Anthropology
Asia
Critical Culture, Gender, and
Race Studies
Criminal Justice and Criminology
Digital Technology and Culture
English
Fine Arts
Foreign Languages and Cultures
History
General Studies
Music
Politics, Philosophy, and
Public Affairs
Politics, Philosophy, and
Public Affairs
Politics, Philosophy, and
Public Affairs
General Studies
History
Sociology
Critical Culture, Gender, and
Race Studies

Bachelor of Fine Arts

Fine Arts

Fine Arts

Bachelor of Music

Music

Music

Bachelor of Science

Biology
Chemistry
Data Analytics
Earth and Environmental Science
Mathematics
Physics
Psychology
Science (Bachelor of)
Zoology

Biological Sciences
Chemistry
Mathematics and Statistics
Environment
Mathematics and Statistics
Physics and Astronomy
Psychology
General Studies
Biological Sciences

Master of Arts

American Studies

Anthropology
Criminal Justice and Criminology
English
Foreign Languages and Cultures
(Spanish)
History
Music
Political Science

Sociology

Critical Culture, Gender, and
Race Studies
Anthropology
Criminal Justice and Criminology
English
Foreign Languages and Cultures

History
Music
Politics, Philosophy, and
Public Affairs
Sociology

Master of Fine Arts

Fine Arts

Fine Arts

Master of Public Affairs

Public Affairs (Vancouver campus)

Politics, Philosophy, and
Public Affairs

Master of Science

Biology
Chemistry
Environmental Science
Geology

Biological Sciences
Chemistry
Environment
Environment

Mathematics
Molecular Plant Sciences
Natural Resource Sciences
Physics
Plant Biology
Plant Pathology
Psychology
(Clinical and Experimental)
Statistics

Mathematics and Statistics
Molecular Plant Sciences
Environment
Physics and Astronomy
Biological Sciences
Plant Pathology
Psychology

Mathematics and Statistics

Doctor of Philosophy

American Studies

Anthropology
Biology
Chemistry
English
Environmental and Natural
Resource Sciences
Geology
History
Materials Science and Engineering
(*Interdisciplinary Program*)
Mathematics
Molecular Plant Sciences
Physics
Plant Biology
Plant Pathology
Political Science

Psychology
(Clinical and Experimental)
Sociology

Critical Culture, Gender, and
Race Studies
Anthropology
Biological Sciences
Chemistry
English
Environment

Environment
History
Materials Science and Engineering

Mathematics and Statistics
Molecular Plant Sciences
Physics and Astronomy
Biological Sciences
Plant Pathology
Politics, Philosophy, and
Public Affairs
Psychology

Sociology

Some of the graduate degree programs are jointly supported by the College of Agricultural, Human, and Natural Resource Sciences and the Voiland College of Engineering and Architecture.

CARSON COLLEGE OF BUSINESS

Larry W. (Chip) Hunter, Dean

Todd Hall, Room 570

509-335-3596

<http://business.wsu.edu>

The Carson College of Business (CCB) is dedicated to world-class research, global learning, professional development, innovative teaching and learning, and the pursuit of excellence in all levels of business education. The college spans campuses across WSU with the largest campus in Pullman, a thriving Global campus, and urban campuses located in Everett, Vancouver, and the Tri-Cities area, and international partnerships and/or programs at the undergraduate or graduate level in Europe and Asia, including China, Greece, Ireland, Italy, Korea, Spain, Switzerland, Tanzania, Thailand, and Vietnam. The college conducts scholarly and applied research, and offers degree programs in a variety of business disciplines, and in hospitality business management, supplementing face-to-face offerings through innovative online learning and international programs. Of note, the CCB is among the top two percent of business schools worldwide to be accredited by the Association to Advance Collegiate Schools of Business International (AACSB) at the baccalaureate, masters, and doctoral levels.

The CCB is dedicated to helping students develop a global perspective and provides students with many opportunities to experience education abroad. In addition to learning about another culture and interacting with students from around the world, study abroad provides students with a lifetime of memories and experiences that will shape their future careers. The CCB's undergraduate international business program accounts for more than 25 percent of WSU's participation in study abroad activities and has been ranked in the top 25 nationally since 2005 by *U.S. News & World Report*.

Innovation and business creation are essential for global competitiveness in the 21st century. Through the CCB's annual business plan competition and national venture forums, students execute and deliver innovative ventures with real-world applications. The business plan competition provides undergraduate,

graduate, and select high school students an opportunity to develop their ideas in interdisciplinary team settings, with experienced entrepreneurs, executives, and venture capitalists as mentors and judges.

The CCB has offered a Master of Business Administration (MBA) for more than 55 years, with graduates occupying leadership positions in all fields of business. The suite of MBA programs includes an Executive MBA, online MBA, full-time MBA, and One-year professional MBA. A certificate in Business Analytics is available to students who complete the professional MBA. The online MBA and the online Executive MBA are ranked in the top 25 Best Online MBA Programs for 2016 and #19 for Best Online MBA Programs for Veterans in 2016 by *U.S. News & World Report*. Additional graduate program offerings include the Master of Accounting and PhD in Business Administration. The Master of Accounting program prepares students for work as certified public accountants. The Doctor of Philosophy in Business prepares its graduates for careers in teaching and research positions and places students at prestigious research institutions.

Additionally, the CCB's Carson Center for Student Success supports the academic, professional, and personal success of the more than 2,800 students. The Carson Center integrates academic advising, careers and involvement, international experience, and scholarship in a single location.

Areas of Study

The college departments—Accounting; Management, Information Systems, and Entrepreneurship; Finance and Management Science; Marketing and International Business—offer the following majors for the Bachelor of Arts in Business Administration degree:

- Accounting
- Business Administration (Vancouver and Tri-Cities campuses only)
- Entrepreneurship
- Finance
- International Business
- Management
- Management Information Systems
- Marketing

Within the college the School of Hospitality Business Management offers a specialized Bachelor of Arts in Hospitality Business Management degree with majors in:

- Hospitality Business Management
- Wine Business Management

In addition to the MBA, the college offers graduate work leading to the Doctor of Philosophy degree in Business Administration (all areas) and to the Master of Accounting.

The Doctor of Philosophy in Business Administration program at WSU is an intensive program of coursework, research and intellectual interaction with faculty and other students that prepares graduates for careers as academic teachers and researchers. Students work closely with individual faculty members and are actively involved in joint research and publication projects throughout the program.

Minors

The CCB offers minors in business administration, human resource management, entrepreneurship, and hospitality business management. For specific information regarding minor requirements, see the business administration and hospitality business management sections of this catalog.

Admission

Admission on the Pullman campus is competitive and based on capacity. Students should certify into hospitality business management or a particular business major upon completion of 60 hours of credits and specific course and GPA requirements (see the certification requirements in the business administration section of this catalog). To be eligible to enroll in 300-400-level business or HBM courses, business and hospitality business management students must have certified in their respective majors upon completion of 60 hours of course work and meeting GPA and other certification requirement.

For specific information regarding the acceptability of college courses taken at other institutions in areas of study offered by the departments of the CCB, prospective students should communicate with the appropriate department chair or with a CCB advisor in the Carson Center for Student Success.

Diversity, Recruitment, and Retention

The CCB is strongly committed to diversifying its student body as well as to improving its retention and graduation rates of underrepresented students. The college strives to create an environment that is supportive and inclusive and where all students can succeed academically and professionally.

Business Degrees

The curricula of the Carson College of Business lead to the following degrees:

Pullman Campus

- Bachelor of Arts, Business Administration
- Bachelor of Arts, Hospitality Business Management
- Master of Accounting
- Master of Business Administration
- Doctor of Philosophy, Business Administration

Tri-Cities Campus

- Bachelor of Arts, Business Administration
- Bachelor of Arts, Hospitality Business Management
- Master of Business Administration

WSU Global Campus

- Bachelor of Arts, Business Administration
- Bachelor of Arts, Hospitality Business Management
- Master of Business Administration
- Executive MBA

Vancouver Campus

- Bachelor of Arts, Business Administration
- Bachelor of Arts, Hospitality Business Management
- Master of Business Administration

Everett Campus

- Bachelor of Arts, Hospitality Business Management

THE EDWARD R MURROW COLLEGE OF COMMUNICATION

Bruce Pinkleton, Interim Dean
Goertzen Hall , Room 101
509-335-8535

<http://murrow.wsu.edu>

Communication is central both to a democratic society and to membership in the global community. The faculty of The Edward R. Murrow College of Communication is dedicated to creating knowledge and facilitating learning about the production and interpretation of messages.

Combining programs that integrate fundamental communication domains, we are uniquely positioned to disseminate knowledge in a world where interpersonal and mediated communication converge.

We are dedicated to educating professional, ethical, and socially responsible citizens. Such an education shall provide students with an understanding of the social, political and ethical implications of communication. We are committed to developing in students a dedication to lifelong learning, communication skills, analytical and critical thinking skills, appreciation of diversity, and professional excellence. Our students learn through traditional teaching methods, innovative approaches to learning and application of professional skills and knowledge. In addition to undergraduate instruction, graduate education is an important component of our mission. Thus, we are also dedicated to guiding exceptional students' development as teachers, researchers, and leading professionals.

Research is necessary to fully serve our constituencies including students, industry, policy makers, and the communication discipline. As active members of a Research I institution, we are dedicated to the pursuit of knowledge regarding the complex and multifaceted nature of communication. We pursue quality research that respects and is informed by diverse disciplines, perspectives, and methods and strive to contribute knowledge with both theoretical and practical implications. Because research enhances teaching, we aim to develop and maintain a mutually beneficial relationship between research and instruction.

As citizens, we endeavor to share our expertise and abilities with the broader community. We are committed to the advancement of the University and local, national, and international communities through service activities beyond

research and instruction. Such activities are exemplified by faculty outreach to various community and industry groups, and by faculty participation in decision making at all levels of the University.

Named for its most illustrious alumnus, The Edward R. Murrow College of Communication is highly regarded nationwide by educators and professionals. It has won national and regional Emmys for student television productions, is recognized nationally for its television news and public relations sequences, and has a diverse faculty and student body in terms of both gender and race.

Study in the college provides students exposure to state-of-the-art computer-based technologies. The Edward R. Murrow College of Communication has writing labs, advanced video and graphics labs, a data analysis lab, a broadcast news lab, two television production studios, several video editing suites, radio/audio labs, and student-run radio and cable television stations.

The Edward R. Murrow College of Communication offers major programs in Journalism and Media Production (Broadcast News; Broadcast Production; Multimedia Journalism), Communication and Society (Communication Technology; Science Communication), and Strategic Communication (Advertising; Integrated Communication; Public Relations). The Murrow College offers the only comprehensive broadcast program in the state of Washington. The college is noted for cutting edge professional skill-building and theory, and is one of only a few programs in the nation that airs a daily, student-produced television newscast.

Admission

To certify a major plan in communication, a student must meet the following minimum requirements: (1) Complete COM 101, 105 and 138; (2) Attain sophomore standing (transfer students should have at least 15 graded units from courses in residence at WSU); (3) Complete The Edward R. Murrow College of Communication Grammar and Writing exam administered by the College of Communication.

Certification is based on the number of available seats, applicant's cumulative WSU GPA, number of credits completed at the time of application, and applicant's performance on the Grammar and Writing Exam. Transfer course grades will not be used in the calculation of the cumulative WSU GPA. Students transferring into the College with 55 or more hours should complete the certification requirements within two semesters. All students should certify before earning 90 credit hours.

A student can be decertified from the Murrow College if their cumulative GPA falls below 2.0 or if they fail to pass a required course.

Requirements for Graduation

Requirements for graduation in the College of Communication vary according to the major and the degree to be granted, as described in the departmental sections of this catalog.

Degrees

The College of Communication offers programs of study leading to the following degrees:

Degree	Emphasis
Bachelor of Arts, Communication	Communication and Society Journalism and Media Production Strategic Communication
Master of Arts	Communication Strategic Communication
Doctor of Philosophy	Communication

COLLEGE OF EDUCATION

Michael S. Trevisan, Dean
Cleveland Hall
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<http://education.wsu.edu>

The College of Education consists of the Department of Educational Leadership, Sport Studies, and Educational/Counseling Psychology, and the Department of Teaching and Learning. The college has both degree and certification

programs. The College of Education offers degree programs which prepare teachers for elementary school, secondary school, and college instruction; specialists and researchers in a variety of educational fields; administrators for schools, colleges, and universities; and sport-related specialists for private and community agencies. The college also provides professional training in sport science, athletic training, counseling, and counseling psychology. It offers a variety of educational services to local school systems.

At the baccalaureate level, the University Common Requirements (UCORE) provide a foundation for professional work in the College of Education through offerings in the arts and humanities and in the social and natural sciences. Practical experiences are integrated with course work throughout professional preparation curricula.

The mission of the certification programs in the College of Education is to furnish intensive preparation for persons who serve or aspire to serve in teaching, supervisory, special services, or administrative fields at all levels of education as well as in related areas of professional services. Candidates for certification must demonstrate knowledge and competencies at qualified levels of professional practice.

Graduate programs in the College of Education offer advanced course work and field experience in education and human services. Certification in administration is available at the graduate level. Doctoral programs focus on preparation of school administrators and counseling psychologists as well as teacher educators and educational researchers. Graduate programs stress scholarship as a basis for all professional endeavors.

The College of Education is a member of the American Association of Colleges for Teacher Education and the University Council on Educational Administration. The doctoral program in counseling psychology is accredited by the American Psychological Association. The athletic training program is accredited by the Commission on Accreditation of Athletic Training Education.

The College of Education also functions as a service institution for schools and communities in the state of Washington. Applied research services are provided to education and health-related agencies throughout the United States and internationally. Services of faculty are available for consultant purposes, school studies, professional development programs, school seminars, and community conferences in the departmental specialties.

Degrees

Degrees offered in the College of Education are as follows:

Degree	Academic Area or Emphasis
Bachelor of Arts Education Sport Management	Teaching and Learning Educational Leadership, Sport Studies, and Educational / Counseling Psychology
Bachelor of Science Athletic Training Kinesiology	Educational Leadership, Sport Studies, and Educational / Counseling Psychology Educational Leadership, Sport Studies, and Educational / Counseling Psychology
Master of Education	Curriculum and Instruction Educational Leadership (K-12) Educational Psychology English Language Learners (ELL) Higher Education Administration Literacy Education Special Education Sport Management
Master of Arts	Counseling (program closed) Curriculum and Instruction Educational Leadership (K-12) Educational Psychology English Language Learners (ELL) Literacy Education Special Education Sport Management

Master in Teaching	Elementary Education Secondary Education
Doctor of Education Doctor of Philosophy	Educational Leadership (K-12) Counseling Psychology (program closed) Cultural Studies and Social Thought in Education Educational Leadership (K-12) Educational Psychology Language, Literacy, and Technology Education Mathematics and Science Education Special Education

VOILAND COLLEGE OF ENGINEERING AND ARCHITECTURE

Candis Claiborn, Dean
Dana Hall, Room 146
509-335-5593
<https://vcea.wsu.edu>

The Voiland College of Engineering and Architecture provides instruction, research, and public service in various engineering disciplines, architecture, construction management, computer science, and materials science. The college offers several engineering degrees including bioengineering, chemical engineering, civil engineering, computer engineering, electrical engineering, materials science and engineering, and mechanical engineering. The School of Design and Construction offers degrees in architecture, interior design, landscape architecture, and construction management. The PhD in materials science is offered through an interdisciplinary program through the Voiland College of Engineering and Architecture and the College of Arts and Sciences. Online master's degrees are offered in electrical power engineering and in engineering and technology management.

The college's undergraduate degree programs prepare graduates for both professional careers and advanced study and are known for their practical, hands-on components, coupled with a strong foundation of basic principles. The college's programs use formal classroom instruction, coupled with individual and group projects, seminars, and individually directed studies to prepare students to develop solutions that are technically, socially, and economically appropriate. Many students also gain work experience in their fields of interest through employment on college research projects or internships in the industry.

The college offers undergraduate degree programs of sufficient breadth to enable its graduates to choose employment from a large number of specialties within their general fields. Opportunities for specialization are made available to qualified students through graduate programs in the various schools and departments.

Faculty, graduate students, and staff in the college perform basic and applied research addressing problems of state, national, and international importance. Research projects are designed to enhance economically, ecologically, and culturally sound use of our material resources and to promote well-balanced industrial and professional development. Research is an integral part of graduate degree programs, providing graduate project topics and opportunities for graduate student interactions with outside professionals. The college's research also strengthens its undergraduate programs by involving undergraduate students in relevant creative exploration and by keeping undergraduate course content current with the latest research developments.

The college provides important educational services to industries, professions, and the general public. Short courses, conferences, and workshops taught by college faculty produce valuable interactions among professionals and deliver current technical information to these audiences. Faculty members of the college also serve as editors, authors, and reviewers for professional journals serving the nation and the world.

Students majoring in degrees offered by the Voiland College of Engineering and Architecture are guided in selection of courses in arts and humanities, social sciences, diversity, and communication to University Common Requirements (UCORE) with needs of the major. Students are encouraged to take UCORE courses concurrently with courses in the major to facilitate effective integration of subjects for practical application. Students planning to transfer to Washington

State University after completing general education requirements at other institutions should obtain sample schedules of studies for their proposed major at WSU to be familiar with specific requirements for that major.

Additional information regarding the Voiland College of Engineering and Architecture is available online at <https://vcea.wsu.edu>.

Engineering

Engineering practice is based on sound fundamental and practical knowledge of mathematics, the sciences, and liberal arts. Basic sciences and mathematics form the foundation on which engineering science and engineering design courses are built. Engineering courses prepare students to solve problems in society by quantitatively analyzing alternatives and making decisions guided by economics and an awareness of social and ethical issues.

The established undergraduate engineering programs offered by the college are accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

Registration as a professional engineer, which is granted by each individual state, is required for many types of positions. The professional curricula in engineering at Washington State University are designed to prepare students to pursue a professional engineering license, starting with the Fundamentals of Engineering (FE) Examination.

Seniors in accredited curricula of the Voiland College of Engineering are encouraged (and sometimes required) to take the FE Examination toward professional registration during their final academic year.

The graduate degrees in engineering, listed previously, are offered at the master's and doctoral levels. Students desiring graduate degrees in areas not listed may arrange with the program of interest to pursue a Master of Science in Engineering or Doctor of Philosophy in Engineering Science, allowing their programs of study to be designed for their particular needs and interests. Admission to engineering graduate programs is open to qualified students with a recognized degree in engineering, mathematics, a physical science, or a biological science. Additional information about specific areas of active research may be obtained by contacting the Associate Dean for Research or the appropriate department chair or school director.

Strong supporting courses are available from Mathematics and Statistics, Physics and Astronomy, Chemistry, and Biological Sciences. The graduate programs are also supported by many excellent University facilities such as the Water Research Center, Laboratory for Atmospheric Research, Composite Materials and Engineering Laboratory, Electron Microscopy Center, Power Systems Engineering Research Center, Energy Systems Innovations Center, Center for Multiphase Environmental Research, Integrated Design Experience, Institute for Sustainable Design, Bioengineering Research Center, Center for Materials Research, Smart Environments Research Center, Center for Asphalt Technology, Sports Science Laboratory, and Washington State Transportation Research Center.

Computer Science

Computer science is the scientific foundation for computing, with roots in mathematics, the sciences, and engineering. Computer science encompasses the theory and techniques by which information is represented, processed, stored, and communicated. It deals particularly with the theory of algorithm and the step-by-step procedures for creating software to solve a problem or accomplish some goal. Students study computer software and hardware systems for efficient solution of practical problems. The Bachelor of Science program in computer science, offered through the School of Electrical Engineering and Computer Science, is accredited by the Computing Accreditation Commission of ABET, <http://www.abet.org>. Curricular specializations available include computer engineering, databases, distributed computing, networks, network security, operating systems, and software engineering. Students use a variety of scientific workstations, graphic workstations, and microcomputer laboratories, all of which are networked to each other and to national networks.

The Bachelor of Arts in Computer Science emphasizes breadth by requiring expertise in computer science and another area. The latter is accomplished through the requirements of a formal minor. The degree is accredited by the Computing Accreditation Commission of ABET, <http://www.abet.org>.

Design and Construction

The School of Design and Construction offers programs of study in architecture, interior design, landscape architecture, and construction management. Practice in these fields relies on studies of the arts and humanities as well as the sciences

and technologies. Courses are designed to provide the breadth and depth of knowledge necessary to respond to the environmental and cultural forces that continually shape the decision-making processes associated with each field.

Programs of study in the school lead to the following degrees: a Bachelor of Science in Architectural Studies (a four-year degree) followed by a 1.5, 2.5, or 3.5 year Master of Architecture degree that is accredited by the National Architectural Accreditation Board (NAAB), a Bachelor of Science in Construction Management (a four-year degree) that is accredited by the American Council for Construction Education (ACCE), a Bachelor of Arts in Interior Design accredited by the Council for Interior Design Accreditation (CIDA), and a Bachelor of Landscape Architecture accredited by the American Society of Landscape Architects (ASLA). The school also offers a Master of Arts in Interior Design and a Master of Science in Landscape Architecture.

Admission

When admitted to Washington State University, students are assigned advisors in their indicated major for the period prior to their being certified in a major. Students may certify into a major after they have completed at least 24 semester credit hours and a prerequisite set of courses for the specific major.

Prospective students in engineering or computer science may apply for certification into the major of their choice upon completion of the applicable program requirements. Prospective students should contact the department or school administering their choice of majors to determine specific courses to be completed, application procedures, and application deadlines for certification. Factors considered in certification decisions include grades in science and math courses, grades in the major, overall grade point average, course repeats, professional experience and goals, and other indicators of the student's potential for successful completion of the curriculum. Students denied certification into an engineering program may appeal to the Dean of the Voiland College of Engineering and Architecture for a review to ensure that departmental procedures were followed.

Degrees

Degrees offered in the Voiland College of Engineering and Architecture at the Pullman campus are listed below (exceptions are listed in parentheses):

Degree	Academic Area
Bachelor of Arts	Computer Science (also Tri-Cities) Interior Design
Bachelor of Landscape Architecture	Landscape Architecture
Bachelor of Science	Architectural Studies Bioengineering Chemical Engineering Civil Engineering (also Tri-Cities) Computer Engineering Computer Science (also Tri-Cities, Vancouver) Construction Engineering Construction Management Data Analytics (also Everett, Global, Vancouver) Electrical Engineering (also Bremerton, Everett, Tri-Cities, Vancouver) Materials Science and Engineering Mechanical Engineering (also Bremerton, Everett, Tri-Cities, Vancouver) Software Engineering (also Everett)
Master of Architecture	Architecture
Master of Engineering and Technology Management	Engineering and Technology Management (Spokane, Tri-Cities, Vancouver only)

Master of Science

Biological and Agricultural Engineering
Chemical Engineering
Civil Engineering
Computer Science
(also Tri-Cities, Vancouver)
Electrical Engineering (also Tri-Cities)
Engineering
Environmental Engineering
(also Tri-Cities)
Materials Science and Engineering
Mechanical Engineering
(also Tri-Cities, Vancouver)
Software Engineering (Global only)
Biological and Agricultural Engineering
Chemical Engineering
Civil Engineering
Computer Science (also Tri-Cities)
Electrical and Computer Engineering
(also Tri-Cities)
Engineering Science
Materials Science and Engineering
(*Interdisciplinary Program*)
Mechanical Engineering
(also Tri-Cities)

Doctor of Philosophy

HONORS COLLEGE

M. Grant Norton, Dean
Honors Hall, Room 130
509-335-4505

<http://honors.wsu.edu>

The Honors College at Washington State University is one of the oldest and most well respected honors colleges in the nation. The mission of the Honors College is to offer students an enriched, four-year core curriculum that satisfies University graduation requirements for general education. Students in the Honors College are not required to complete University Common Requirements (UCORE) because the Honors curriculum fulfills the graduation requirements. However, students who transfer to UCORE before graduation will be held to all University Common Requirements.

The Honors curriculum is designed to be compatible with any major. Through small classes taught by experienced and enthusiastic faculty dedicated to scholarship and learning, the Honors College helps students develop a lifelong love of learning, as well as skills in critical thinking, writing, public presentation, information literacy, and cultural competency. By completing an enriched series of small classes, and a thesis, students admitted into the Honors College acquire the broad foundations of liberal learning in the natural and social sciences, the arts and humanities, and cultures of the world. In addition, the Honors College emphasizes study of foreign languages and education abroad as premier vehicles for gaining key competencies for an increasingly globalized society and economy. The Honors College offers a number of advantageous opportunities for education abroad and requires demonstration of competency in a second spoken language before graduation.

Admission to the Honors College

High school students who have shown excellent scholastic ability, intellectual achievement, and motivation should apply to join the Honors College. The Honors College welcomes students from all cultural and academic backgrounds who are willing to take risks and want to engage in this special academic opportunity. Students who have applied to the Honors College and have not been invited within three weeks of their acceptance to WSU should contact Honors. Current Washington State University students who have achieved a college grade point average of at least 3.5 and transfer students should contact Honors if they are interested in the program. International students should contact Honors to find out how they can be considered for admission. For more information on the Honors College, please refer to the departmental section of this catalog and our website.

ELSON S. FLOYD COLLEGE OF MEDICINE

John Tomkowiak, Founding Dean
509-358-7549

The WSU Health Sciences Campus in Spokane is the home of the Elson S. Floyd College of Medicine, under the direction of Dr. John Tomkowiak, fosters active learning classrooms and interdisciplinary teaching, research, outreach, and clinical services.

Degrees

The College of Medical Sciences offers the following degree programs:

Degree	Academic Area
Bachelor of Arts	Speech and Hearing Sciences
Master of Science	Speech and Hearing Sciences

COLLEGE OF NURSING

Joyce Griffin-Sobel, Dean
PO. Box 1495
Spokane, WA 99210-1495
509-324-7360
<http://nursing.wsu.edu>

The College of Nursing offers degrees in nursing at the baccalaureate (BSN), master's (MN), Doctor of Nursing Practice (DNP), and PhD levels to develop responsible citizens and to provide the professional knowledge, skills, and values essential to the practice of nursing. The undergraduate program curricula includes both liberal arts education and preparation as a generalist in the practice of nursing. The curriculum at the graduate level provides preparation for advanced, specialized nursing practice, leadership, and research.

Admission and application deadlines for all programs can be found at the College of Nursing website: <http://nursing.wsu.edu>.

Undergraduate Programs

WSU College of Nursing's undergraduate programs are approved by the Washington State Nursing Care Quality Assurance Commission and are accredited by the Commission on Collegiate Nursing Education. Approximately 800 pre-licensure and registered nurse students are enrolled in the baccalaureate nursing programs at the state-wide Health Sciences campus in Spokane, at WSU campuses in the Tri-Cities and Vancouver and sites in Yakima and Walla Walla.

The pre-licensure undergraduate program is open to students beginning a nursing career. The curriculum consists primarily of 300- and 400-level courses and is four academic years in length. The first two years of the curriculum (lower-division component) are completed on the Pullman campus or at any institution offering courses equivalent to those taught at Washington State University. Courses are offered in Spokane, Yakima, and the Tri-Cities. Graduates are eligible to apply for licensure as registered nurses.

The post-licensure undergraduate program is open to registered nurses who completed an Associate Degree in nursing and who wish to obtain a baccalaureate degree in nursing. Courses leading to the BSN (300- and 400-level courses) are provided at WSU campuses in Spokane, Tri-Cities and Vancouver as well as in Yakima and Walla Walla.

Graduates may practice in a variety of settings, including hospitals, community health agencies, schools, long-term care facilities, occupational health programs, home health care, and community mental health centers.

Admission

All students planning to major in nursing must apply to the Office of Admissions at WSU and be admitted to the University. Requirements may be met at WSU or may be transfer credits from another institution of higher education. The College of Nursing uses a Centralized Application Service (CAS) for prelicensure applicants.

All registered nurses planning to apply to the nursing major at WSU must do so through the Admissions Office at the WSU campus where they will attend

classes. Applications are available throughout the year. Students are encouraged to contact an advisor at their campus for lower-division advising.

Registered nurse applicants must be graduates of an approved community college or hospital school of nursing and be currently licensed or eligible for licensure to practice in the state of Washington at the time of application. Admission to the 300-400-level nursing major is based upon evaluation of the student's entire application.

Since the number of applicants to WSU College of Nursing may exceed the number that can be admitted, there is no assurance that all persons meeting the admission criteria will be selected.

Graduate Programs

WSU College of Nursing's undergraduate programs are approved by the Washington State Nursing Care Quality Assurance Commission and are accredited by the Commission on Collegiate Nursing Education. The Master of Health Policy Administration program is approved by the Commission on Accreditation of Healthcare Management Education.

The Master of Nursing in Population Health (MN-PH) includes three curricular options leading to the Master's degree: nursing leadership, nursing education, and the individualized program of study. The MN-PH program also offers two post-masters certificate options in nursing leadership and nursing education. The RN-MN program at WSU College of Nursing allows registered nurses with a bachelor's degree in another discipline to pursue an advanced degree.

The Master of Health Policy Administration degree prepares students for leadership roles in the field of healthcare management and policy. Ideal for students continuing their education or working professionals seeking advancement, this program offers evening classes, a personalized project-based learning environment, and strong regional and national industry connections.

The post-baccalaureate DNP Program offers prospective students with a baccalaureate degree in nursing the opportunity to earn a degree in one of three areas: Family Nurse Practitioner (DNP-FNP), Psychiatric Mental Health Nurse Practitioner (DNP-PMHNP), or Population Health (DNP-PH). Graduates of the FNP and PMHNP programs are eligible to complete a national certification examination leading to state licensure as Advanced Registered Nurse Practitioners. The post-master's DNP Program offers prospective students with a master's degree in nursing the opportunity to add expertise in research and leadership to their current practice or to pursue specialization as a DNP-FNP or DNP-PMHNP.

The PhD program in Nursing includes a core of nursing science, analytical, and education, and research courses guiding the student to conduct qualitative or quantitative inquiry. The PhD program prepares students as nurse scientists, able to carry out independent research; and to serve as leaders in nursing education. Full or part-time plans of study are available. The Post-Baccalaureate to PhD in Nursing allows students with a baccalaureate (non-nursing degrees are accepted) and a RN license to enter the PhD program after two semesters of Master's level courses.

All graduate programs and courses are offered in hybrid delivery (requiring attendance at some on-campus courses and including the completion of some learning activities via live interactive videoconference and using internet-based course management software).

Professional Development

The Office of Professional Development at the WSU College of Nursing focuses on meeting specific learning needs of registered nurses in the community, state and throughout the country. Cost effective programs are made available to promote professional certification, licensure and re-licensure. The Office of Professional Development is an approved provider of continuing education by the Washington State Nurses Association (an accredited approver by the American Nurses Credentialing Center Commission on Accreditation) and by the Office of the Superintendent of Public Instruction in Washington. For more detailed information on programs offered visit www.nursing.wsu.edu.

Degrees

The degrees offered through the WSU College of Nursing are as follows:

Degree	Academic Area
Bachelor of Science in Nursing	Generalized practice of professional nursing

Master of Health Policy and Administration	Health Policy and Administration
Master of Nursing	Advanced Population Health
Doctor of Nursing Practice	Advanced Population Health Family Nurse Practitioner Psychiatric Mental Health Nurse Practitioner
Doctor of Philosophy	Nursing

COLLEGE OF PHARMACY

Gary Pollack, Dean
Pharmaceutical & Biomedical Sciences Building Room 120K
WSU Spokane Campus
509-368-6605
www.pharmacy.wsu.edu

Doctor of Pharmacy

The College of Pharmacy offers a course of study leading to a Doctor of Pharmacy (PharmD) degree. The PharmD schedule of studies involves four professional years. The first three professional years of the PharmD curriculum are delivered on the WSU Health Sciences campus in Spokane, Washington. In addition to our pharmacy program on the WSU campus in Spokane, a satellite campus is located in Yakima on the campus of Pacific Northwest University Health Sciences (PNWU). The fourth professional year of the PharmD curriculum consists of advanced experiential training, in which students will be assigned to one of the following geographic locations: Spokane, Yakima, Tri-Cities/Walla Walla, Wenatchee, Seattle/Tacoma, Olympia, or Pullman. Students are expected to complete the majority of rotations in their assigned geographic locations. Students will gain experience in a variety of health care environments, including community, institutional, and long-term care settings. One hundred twenty-five students are enrolled annually in the fall on the Spokane campus, and 30 students are expected to be enrolled annually in the fall on the Yakima campus in the first professional year of the PharmD program.

A PharmD/PhD combined degree option is available to train clinician scientists. Interested students may apply for PhD admission concurrently with their PharmD application, or alternatively during the first two years of their progression through the PharmD program. A PharmD/MBA combined degree option is available to help support the development of future pharmacy business leaders and entrepreneurs.

The application period each academic year is July to January, and students should prepare and submit their application one calendar year before they intend to begin the pharmacy program. A bachelor's degree is not required for admission; prerequisites for admission typically require three years of pre-pharmacy education. For additional information regarding the Doctor of Pharmacy curriculum, please see the College of Pharmacy home page at <http://www.pharmacy.wsu.edu>, or contact the Office of Student Services at 509-368-6605.

Graduate Programs

The mission of the Graduate Program in the Pharmaceutical Sciences is to prepare graduates for careers in academia, industry, and other public and private institutions dedicated to the promotion of human health. The PhD in Pharmaceutical Sciences program provides graduate training in cancer biology, drug discovery, and translational pharmacology. Faculty in the program utilize multi-disciplinary and translational research approaches to (1) understand mechanisms of disease, (2) identify novel therapeutic targets, (3) develop novel treatments, and (4) optimize therapeutic regimens. We strive to prepare students to become independent and creative problem solvers who will develop into leaders in their respective fields.

Students entering the program should have completed undergraduate work that includes biology, chemistry (including organic chemistry and biochemistry), mathematics (through calculus), and organ/mammalian physiology. Students working toward the PhD in Pharmaceutical Science are expected to develop an area of research emphasis that is consistent with the capabilities and interests of the faculty.

A PharmD/PhD combined degree option is available to train clinician scientists. Interested students may apply for PhD admission concurrently with their PharmD application, or alternatively during the first two years of their progression through the PharmD program.

Applications for admission to the graduate program must include: official GRE scores, official transcripts for all college level work, three letters of recommendation, and a letter discussing career goals, previous research experience, and research interests. For students whose native language is not English, TOEFL scores are required. Inquiries should be emailed to: gradprograms@pharmacy.wsu.edu.

Degrees

The College of Pharmacy offers the following degree programs:

Degree	Academic Area
Master of Science	Pharmaceutical Sciences
Doctor of Pharmacy	Pharmacy
Doctor of Philosophy	Pharmaceutical Sciences

COLLEGE OF VETERINARY MEDICINE

Bryan Slinker, Dean
Bustad Hall, Room 110
509-335-9515
<http://vetmed.wsu.edu>

Faculty and curricula within the College of Veterinary Medicine provide a challenging, hands-on education for students in the life and biomedical sciences. Both undergraduate and graduate degree programs within the college include classroom instruction, seminars, special projects, and research, which together provide the education needed to meet society's needs.

The Undergraduate students planning to pursue advanced work in graduate or professional schools are advised to plan curricula to meet admission requirements for advanced study. Many undergraduate majors conduct research projects under the supervision of a faculty member. In fact, this hands-on introduction to scientific discovery is a hallmark of these programs. Creative programs (such as the STARS program) are designed to facilitate the transition from undergraduate to graduate programs.

Graduate students are prepared for many exciting careers in life and health sciences by engaging in cutting-edge research in many areas, including regulation of cellular growth and differentiation, genetic engineering, chromosome biology, protein synthesis and export, repair of DNA, cancer cell biology, biochemical mechanism of muscle contraction, chemotaxis, coevolution of plants and animals, reproductive biology, immunology, infectious diseases of humans and animals, cellular and systems neurosciences, and global health. All graduate students participate under the umbrella of activities sponsored by the integrated Program in Biomedical Sciences (iPBS) in support of interdisciplinary training and professional development. Students who enter the graduate programs in the College participate in these iPBS training elements in addition to requirements unique to each degree-granting program.

The Doctor of Veterinary Medicine (DVM) curriculum of the College of Veterinary Medicine prepares students for positions in many areas of veterinary medicine, e.g., private practice, federal and state disease regulatory programs such as the USDA and CDC, industry, teaching, research, and military services. DVM students may also engage in research as part of their education. The DVM degree is recognized by all state and territorial licensing boards, as well as those in foreign countries, and is fully accredited. Complete information on DVM admission and program requirements may be found in this catalog under departmental listings and on our website.

Many of the college's faculty have attained national and international reputations and have received numerous honors and awards. These include election to the IOM and as fellows of the AAAS, state and national teaching awards, national career development awards, and National Institutes of Health Merit Awards. Faculty frequently serve on national review panels of granting agencies for instructional and research support, as well as on editorial boards of international journals.

Degrees

The College of Veterinary Medicine offers courses of study leading to the following degrees:

Degree	Academic Area
Doctor of Veterinary Medicine	Veterinary Medicine
Bachelor of Science	Biochemistry Genetics and Cell Biology Microbiology Neuroscience
Master of Science	Molecular Biosciences Neuroscience Veterinary Science
Doctor of Philosophy	Molecular Biosciences Neuroscience Veterinary Science

Regional Program in Veterinary Medical Education

Washington State University's DVM education program is offered in a regional partnership with the University of Idaho, Montana State University, and Utah State University. This regional program involves instruction on the WSU campus, at Montana State University (Bozeman, MT), Utah State University (Logan, UT), and at the Caine Center in Caldwell, ID (UI). Specific quotas of students to be admitted from Idaho, Montana, and Utah have been established under the terms of these agreements. In addition, the College of Veterinary Medicine at Washington State University is a partner in the Western Interstate Commission for Higher Education (WICHE) with the states of Arizona, Hawaii, Montana, New Mexico, Nevada, North Dakota, and Wyoming. Under the terms of this agreement, a student certified and admitted as a resident from one of these states is sponsored financially by their home state and is thus subject only to the same fees as Washington resident students. Students must apply to their home state for WICHE certification in addition to applying to the College of Veterinary Medicine at Washington State University. Additional information regarding WICHE regional veterinary education may be obtained from the Executive Director, Western Interstate Commission for Higher Education, 3035 Center Green Dr., Suite 200, Boulder, CO 80301-2204, 303-541-0214, <http://wiche.edu>.

The Graduate School

William Andrefsky, Dean
French Administration Building, Room 324
509-335-6424
<https://gradschool.wsu.edu>

Graduate school has been described as a select community of scholars, faculty, and students dedicated to the extension of scholarship and the advancement of knowledge for the ultimate common good of mankind. The fields of intellectual and scholarly activity are numerous, and the student who contemplates graduate study should select one that offers a superior program in the chosen field. The student should study the accomplishments of the members of the graduate program faculty, the adequacy of the research facilities, and the appropriateness of the curricula. For many, the Graduate School of Washington State University will provide advantageous and attractive opportunities.

Prospective graduate students should prepare themselves adequately, both in the fundamental subject matter necessary for their advanced work and in the other branches of learning, in order to more intelligently fulfill their responsibilities of leadership and service to society.

In a graduate program, a student is required to complete appropriate advanced courses, to participate in seminars, and to make an original contribution to knowledge. At least one academic year of graduate study, or the equivalent, is necessary for the completion of a program leading to a master's degree. A doctoral degree is awarded in recognition of distinctive scholarship. The period of study for the doctoral degree is at least three years (six semesters) beyond the baccalaureate degree. Most advanced degree programs emphasize the preparation of students for careers as productive scholars, and accomplishments in research constitute an important part of the training. It is recognized also that those who earn advanced degrees often become the teachers in our institutions of learning. For this reason, many departments give special attention to the preparation of students for careers in the teaching profession.

Graduate students are subject to the usual procedures and regulations of the institution and to the Graduate School rules and procedures as outlined on the following pages and in the Graduate School Policies and Procedures.

The Graduate School facilitates advanced study and research with members of WSU faculty. Graduate instruction and research are carried on in most of the regularly organized departments. Programs of study leading to advanced degrees are under the governance of the Faculty Senate's Graduate Studies Committee.

The faculty involved in graduate education consists of the president of Washington State University, the deans of the various academic units, the chairs of the academic departments and programs in which advanced degree programs are offered, and other selected members of the faculty. Members of the faculty involved in graduate education have the responsibility of offering courses limited to graduate students, guiding graduate seminars, serving as thesis advisors and members of thesis committees, administering Graduate School examinations (master's, preliminary, and doctoral) and, occasionally serving as a member of the Graduate Studies Committee. Graduate students have opportunities for studying and working in a close professional relationship with these faculty members who have been selected because of their special competence and interest.

The overview below outlines the basic policies and procedures for the Graduate School at Washington State University; however it is not meant as a comprehensive discussion. Detailed policies and procedures may be found at <https://gradschool.wsu.edu/policies-procedures>.

Admission

Graduates of Washington State University and other colleges and universities whose degrees are recognized by this institution and who meet the requirements for graduate admission may be admitted to the Graduate School. For interpretations, inquiries should be directed to the dean of the Graduate School. Prospective graduate students who have established superior academic records and whose degree interests are compatible with the programs offered at Washington State University are invited to apply for admission to the Graduate School.

Students who consider entering the Graduate School should apply online from the Graduate School web-site at <https://gradschool.wsu.edu>. For admission to the Graduate School, Washington State University requires official transcripts from each of the following: (1) colleges or universities attended for any undergraduate course work; (2) colleges or universities from which any degrees have been granted or are expected; (3) colleges or universities showing graded graduate-level (including doctoral) course work taken after the bachelor's degree. Note: Students intending to request transfer credit for their program of study will need to submit official transcripts from colleges or universities showing such credit. Departments and programs are free to request additional transcripts as deemed appropriate. Official transcripts are those mailed directly to the Graduate School from the registrar of the institution attended. Complete credentials should be on file at least one month before registration. Transcripts from other institutions cannot be returned. Records of previous work at Washington State University need not be submitted.

In general, admission to the Graduate School on regular student status requires at least a B (3.00 on a 4.00 scale) cumulative grade point average for graded undergraduate work. Admission is to be on the basis of graduate study elsewhere when it has been accomplished in a recognized graduate school with at least a B (3.00) average in 12 or more semester hours of graded graduate work beyond the bachelor's degree. Provisional admission may be granted to those students recommended by a department whose average is below 3.00, provided their total record indicates a high probability of success.

Admission of a student from a foreign university may be approved by the dean of the Graduate School if the student presents a superior academic record, furnishes satisfactory evidence of adequate ability in English, and has sufficient financial resources.

Because of limitations within certain departments, it may be necessary to deny admission to some qualified applicants. Students who come to Washington State University before receiving the admission certificate do so at their own risk. The complete policies and procedures regarding admissions can be found at www.gradschool.wsu.edu.

Transfer of Graduate Credits

Appropriate graduate level credits (with a grade of B or higher) earned in other accredited graduate schools may be applied to a limited extent toward an advanced degree. The number of such hours is limited to no more than half the total graded course credits required by the program as listed on the Program of Study. Individual departments/programs may choose to limit transfer credits to an amount less than what is specified above. Use of WSU credit earned prior to formal admission to the Graduate School is restricted. For necessary interpretations, inquiries should be sent to the dean of the Graduate School.

Summer Session

Credit earned during summer session at Washington State University may be applied in the same manner and subject to the same rules and regulations as credit earned during fall and spring semesters.

In a number of departments there are unusually good opportunities for research during the summer months. Summer work in the College of Education is planned especially to meet the needs of teachers and administrators.

Graduate Work Through the WSU Global Campus

Credit earned in graduate-level courses taken online through the WSU Global Campus will be accepted on graduate student programs without limit, subject only to customary admission and program approvals.

No workshops, extension credits, or continuing education courses from other institutions, or credit earned by special examination may be used to meet advanced degree requirements.

Graduate Study by Seniors

Seniors who have at least a 3.00 grade point average in the last 60 hours of their undergraduate work at Washington State University may register for up to 6

semester hours of work in the Graduate School in excess of the number of hours required to complete the bachelor's degree. Graduate School approval is required at the time of registration. Only grades of B or higher may be applied toward an advanced degree. Work done by an undergraduate under other conditions may not be applied toward an advanced degree.

Seniors who wish to enroll in 500-level courses must obtain approval of the major advisor and the chair of the department or program in which the course is offered.

Select Graduate Admission Program

The SGA Program is to encourage outstanding undergraduate students with top academic records to remain at WSU for a graduate degree by (1) extending an early offer of admission and support to outstanding candidates, (2) removing financial and other costs associated with regular application, and (3) potentially reducing the total number of combined semesters required to complete the undergraduate/graduate degree (without reducing the credit requirements for either).

Registration

All degree-seeking graduate students must maintain continuous enrollment in the Graduate School, and register for each semester, excluding summer session, from the time of first enrollment until all requirements for the degree are completed. Continuous enrollment may be maintained through: 1) full-time enrollment, 2) part-time enrollment, 3) continuous doctoral status, or 4) approved leave of absence.

Degree-seeking students who fail to maintain continuous enrollment or official leave status for up to two consecutive semesters (excluding summer) must complete a re-enrollment form to re-enroll and will be assessed a fee. Re-enrollment requires departmental approval and is not guaranteed. Degree-seeking students who fail to reenroll after two consecutive semesters (excluding summer) will be dropped from the University. Students who want to be readmitted to the program will be required to reapply and pay an application fee. Readmission is not guaranteed.

Non-degree-seeking students who are not enrolled for up to four consecutive semesters (excluding summer) must complete a re-enrollment form and pay a reenrollment fee. Re-enrollment requires departmental approval and is not guaranteed. After four consecutive semesters (excluding summer) of non-enrollment, students will be dropped from the university. Students who want to be readmitted to the program will be required to reapply and pay an application fee. Readmission is not guaranteed.

Special Projects or Independent Study (600), Master's Research, Thesis, and/or Examination (700), Master's Independent Capstone Project and/or Examination (701), Master's Special Problems, Directed Study, and/or Examination (702), and Doctoral Research, Dissertation, and/or Examination (800) shall have as prerequisite degree-seeking or provisional student status in the Graduate School. The grades assigned for 700, 701, 702, and 800 credits will be S, U, X, I, or W. For students enrolled in these credits, the F grade is not available.

Registration Policy for Graduate Students Completing Degree Requirements

Graduate students must register for a minimum of two 700, 701, 702, or 800 credits during the semester or summer session in which they take their final examinations. Fall and spring semesters and summer session officially end at the time final grades are due in the Registrar's Office. Examinations are not normally scheduled between regular terms. However, students who have received special permission from the Graduate School to schedule final master's or doctoral oral examinations in the interim nonclass period must be enrolled in a minimum of two research credits in the previous semester.

Academic Standards

A student must earn a 3.00 grade point average for all course work (including all courses listed on the program and other graduate upper- and lower-division courses). No work of B- grade or less may be dropped from a program, nor can a course be repeated for a higher grade if the final grade is C or higher. Any course listed on the program in which a grade of C-, D, or F is earned must be repeated.

An 'I' grade for incomplete work for a course will be changed to an F grade if the work is not completed within one academic year following the semester in which the 'I' grade was assigned, unless a shorter time is specified by the instructor. All outstanding incomplete work (including grades of I, X, and blank/

no grade) must be completed and posted to the official transcript prior to the conferral of the degree.

Any graduate student who fails to maintain a cumulative grade point average of 3.00 or higher for all course work taken after more than one semester of graduate study, or who receives two or more U (unsatisfactory) grades for research/special project credits, will be dismissed from the University. Reinstatement of an academically deficient student may be considered only through a recommendation made by the chair of the major department to the dean of the Graduate School.

Requirements for a Graduate Degree

The Graduate School's graduation requirements for the completion of a graduate degree are those published in the Graduate School Policies and Procedures Manual in effect at the time of the student's initial admission as a regular or provisional graduate student. Departmental requirements for graduation are those in effect at the time the student files a program of study.

Subsequent changes in degree requirements of the Graduate School or in departmental requirements may be substituted at the option of the student upon approval by the master's or doctoral committee, the department chair, and the dean of the Graduate School.

If a student is dropped from the University for failure to maintain continuous enrollment, the graduation requirements of the Graduate School are those in effect at the time of readmission to the Graduate School.

Time Limit

The time limit for the use of graduate credits toward a graduate certificate and master's degree is six years from the beginning date of the earliest course applied toward the degree.

Work for the doctoral degree should be completed within three years of the date of the satisfactory completion of the preliminary examination, and within ten years of the earliest course applied toward the degree. At least four months must elapse between preliminary and final examinations for doctoral degrees.

Funding Your Education

Assistantships

One of the most common sources of funding is the graduate assistantship, which provides financial support to a graduate student who engages in teaching, research, and/or service. Graduate assistantships may include a tuition waiver, health insurance, and a monthly salary. The Graduate School website and Graduate School Policies and Procedures Manual should be consulted concerning qualifications, eligibility, and appointment procedures.

Departments and programs generally make assistantship offers during the admissions process; however, current students may be eligible for an assistantship in their program if funding is available. Students should contact their department chair and/or program director for more information about available assistantships in their program. Most offers of assistantship are made by April 15 for the following academic year. Washington State University subscribes to the following Resolution of the Council of Graduate Schools in the United States regarding scholars, fellows, trainees, and graduate assistants:

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

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

Scholarships and Awards

Each year graduate students of outstanding achievement are recognized with numerous awards, including the Achievement Rewards for College Scientists, AFW Graduate Student Awards, Graduate and Professional Student Awards, President's Award, and the GPSA Research Exposition. Students can learn more about these awards by visiting <https://gradschool.wsu.edu>. Students can also refer to the Office of Financial Services and their departments for scholarship opportunities.

Fellowships

Fellowships and traineeships vary considerably, each with its own set of guidelines and restrictions set by the funding agency. WSU offers fellowships and traineeships through the Graduate School and academic departments as well as other external agencies. Graduate fellows who meet all eligibility criteria will be appointed through their respective academic departments. Students can also refer to the Office of Grant and Research Development Informer website at <http://informer.ogrd.wsu.edu> to learn more about grant funding opportunities.

Internships

Internships can enhance students' future employment opportunities by providing relevant skills, workplace experience, and a network of business professionals in career fields. Students should work with faculty advisors to identify potential internship opportunities that fit within their program of study. Students who wish to participate in a fall or spring internship are required to meet the University's continuous enrollment policy by either enrolling in a minimum of two graduate credits, be in continuous doctoral status, or be approved for official internship leave. Please see the complete Internship Leave policy.

Degrees and Certificates Granted

--See Program Location Key and Degree Acronyms following this list.

Doctor of Philosophy, PhD

Agricultural Economics (P)
 American Studies (P)
 Animal Sciences (P)
 Anthropology (P)
 Biological and Agricultural Engineering (P)
 Biology (P)
 Business Administration
 Accounting (P)
 Finance (P)
 Hospitality and Tourism (P)
 Information Systems (P)
 Management (P)
 Marketing (P)
 Operations and Management Science (P)
 Chemical Engineering (P)
 Chemistry (P)
 Civil Engineering (P)
 Communication (P)
 Computer Science (P)
 Criminal Justice and Criminology (P)
 Crop Science (P)
 Economics (P)
 Education
 Counseling Psychology (P) (Program closed - in teach-out status)
 Cultural Studies and Social Thought in Ed. (P)
 Educational Leadership (P)
 Educational Psychology (P)
 Language, Literacy, and Technology (P)
 Mathematics and Science Education (P)
 Special Education (P)
 Electrical and Computer Engineering (P)
 Engineering Science (P)
 English (P)
 Entomology (P)

Environmental and Natural Resource Sciences (P)
 Food Science (P)
 Geology (P)
 History (P)
 Horticulture (P)
 Individual Interdisciplinary (P)
 Materials Science and Engineering (P)
 Mathematics (P)
 Mechanical Engineering (P)
 Molecular Biosciences (P)
 Molecular Plant Sciences (P)
 Neuroscience (P)
 Nursing (S)
 Nutrition and Exercise Physiology (S)
 Pharmaceutical Sciences (S)
 Physics (P)
 Plant Biology (P)
 Plant Pathology (P)
 Political Science (P)
 Prevention Science (P, S, V)
 Psychology
 Clinical (P)
 Experimental (P)
 Sociology (P)
 Soil Science (P)
 Veterinary Science
 Combined Anatomic and Pathological Residency (P)
 Combined Clinical Microbiology Residency (P)
 Immunology and Infectious Diseases (P)
 Integrative Physiology and Neuroscience (P)
 Veterinary Clinical Training Program (P)
 Zoology (P)

Master of Arts, MA

American Studies (P)
 Anthropology (P)
 Apparel, Merchandising, and Textiles (P)
 Communication (P)
 Strategic Communication (G)
 Criminal Justice & Criminology (P, S)
 Education
 Counseling (P) (Program closed - in teach-out status)
 Curriculum and Instruction (P, S, T, V)
 Educational Leadership (P, S)
 Educational Psychology (P)
 English Language Learners (P)
 Literacy Education (P)
 Special Education (P, V, G)
 Sport Management (P, G)
 English (P)
 Foreign Languages and Cultures (P)
 History (P, V)
 Interior Design (P)
 Music (P)
 Political Science (P)
 Sociology (P)

Master of Science, MS

Agriculture (G)
 Food Science and Management (G)
 Plant Health Management (G)
 Animal Sciences (P)
 Applied Economics (P)
 Biological and Agricultural Engineering (P)
 Biology (P)
 Chemical Engineering (P)
 Chemistry (P, T)
 Civil Engineering (P, T)
 Computer Engineering (P)
 Computer Science (P, T)

Computer Science - Vancouver
Coordinated Program in Dietetics, Nutrition, and Exercise Physiology (S)
Crop Science (P)
Electrical Engineering (P, T)
Engineering (P)
Entomology (P)
Environmental Engineering (P, T)
Environmental Science (P, T, V)
Food Science (P)
Geology (P)
Horticulture (P)
Landscape Architecture (P)
Materials Science and Engineering (P)
Mathematics (P)
Mechanical Engineering (P, T)
Mechanical Engineering - Vancouver
Molecular Biosciences (P)
Molecular Plant Sciences (P)
Natural Resource Sciences (P)
Neuroscience (P)
Nutrition and Exercise Physiology (S)
Pharmaceutical Sciences (S)
Physics (P)
Plant Biology (P)
Plant Pathology (P)
Prevention Science (P, S, V)
Psychology (P)
Software Engineering (G)
Soil Science (P)
Speech and Hearing Sciences (S)
Statistics (P)
Veterinary Science
 Combined Anatomic and Pathological Residency (P)
 Combined Clinical Microbiology Residency (P)
 Immunology and Infectious Diseases (P)
 Integrative Physiology and Neuroscience (P)
 Veterinary Clinical Training Program (P)

Specialized Graduate Degrees

Accounting, M.Acc. (P)
Architecture, M.Arch. (P)
Education Degrees
 Curriculum and Instruction, EdM (P)
 Curriculum and Instruction, EdD (P)
 Educational Leadership, EdM (P, S, T, V)
 Educational Leadership, EdD (P, S, T, V)
 Educational Psychology, EdM (P)
 English Language Learners, EdM (P, T, V)
 Literacy Education, EdM (P, T, V)
 Special Education, EdM (P, S, V, G)
 Teaching (elementary), MIT (P, S, T, V)
 Teaching (secondary), MIT (P, S, T, V)
Electrical Power Engineering, PSM (G)
Engineering & Technology Management, METM (G)
Master of Fine Arts, MFA (P)
Health Policy and Administration, MHPA (S)
Molecular Biosciences, PSM (G)
Nursing
 Advanced Population Health, DNP (S, V, T)
 Advanced Population Health, MN (S, T, V)
 Family Nurse Practitioner, DNP (S, V, T)
 Psychiatric/Mental Health Nurse Practitioner, DNP (S, V, T)
Public Affairs, MPA (V)

Professional Programs

Doctor of Pharmacy (S)
Doctor of Veterinary Medicine (P)
Master of Business Administration (P, T, V, G)

Certificates

Bioethics
Biotechnology Management
C-NSPIRE: Carbon and Nitrogen Systems Policy Oriented Integrate Research and Education
Constraints Management
Construction Project Management
Digital Humanities and Culture
Educational Research Methods
Engineering Nanotechnology
English Language Learner
Family Nurse Practitioner
Global Justice and Security Studies
Global Justice and Security
Health Assistive Smart Environment Design
Logistics and Supply Chain Management
Manufacturing Leadership
Molecular Biosciences
Nuclear Materials
Nurse Educator
Nursing Leadership
Project Management
Protein Biotechnology
Psychiatric Mental Nurse Practitioner
Radiation Protection
Reproductive Biology
Six Sigma Quality Management
Sustainable Agriculture
Systems Engineering Management
Teaching English as a Foreign Language

--Program Location Key

(G) Global, Online
(P) Pullman
(S) Spokane
(T) Tri-Cities
(V) Vancouver

--Degree Acronyms

DNP=Doctor of Nursing Practice
EdD= Doctor of Education
EdM=Master of Education
MA=Master of Arts
MBA=Master of Business Administration
MAcc=Master of Accounting
MArch=Master of Architecture
METM=Master of Engineering & Technology Management
MFA=Master of Fine Arts
MHPA=Master of Health Policy and Administration
MIT=Master in Teaching
MN=Master of Nursing
MPA=Master of Public Affairs
MS=Master of Science
PhD=Doctor of Philosophy
PharmD=Doctor of Pharmacy
PSM=Professional Science Masters

Global and Regional Campuses and Statewide Sites

BREMERTON

Murari Kejariwal, Clinical Associate Professor and Program Coordinator, Electrical Engineering
1600 Warren Avenue
Bremerton, WA 98337
360-473-2843
murari.kejariwal@wsu.edu
<http://www.mme.wsu.edu/wsuMEoch/>

Washington State University's School of Electrical Engineering and Computer Science offers a Bachelor of Science in Electrical Engineering program in Bremerton, Washington. The majority of courses at the Bremerton campus are taught by full-time resident faculty in Bremerton. These are augmented by courses taught by Pullman faculty that originate from the Pullman Campus and some local adjunct faculty who, given their education and professional experience, enhance the educational experience for students. Students are advised by WSU faculty and staff who are resident in Bremerton.

Marvin Pitts, Clinical Professor and Program Coordinator, Mechanical Engineering
1600 Chester Avenue
Bremerton, WA 98337
360-475-7543
pitts@wsu.edu
<http://www.mme.wsu.edu/wsuMEoch/>

Washington State University's School of Mechanical and Materials Engineering offers a Bachelor of Science in Mechanical Engineering program in Bremerton, Washington. The School has professors on the Pullman, Tri-cities, Bremerton, and Everett campuses providing students with both academic and career advising. The majority of courses are taught by the resident faculty. Adjunct and visiting faculty are also utilized to enhance the educational opportunities for the students. Courses at the Bremerton campus are a combination of those provided by local faculty and those delivered from other campuses.

The WSU BSME degree program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

Degrees Offered at Bremerton

Undergraduate Degrees

Electrical Engineering, BS
Mechanical Engineering, BS

GLOBAL CAMPUS

David Cillay, Vice President
WSU Global Campus
106 Van Doren Hall
Pullman, WA 99164-5210
800-222-4978 / 509-335-3557
<http://global.wsu.edu>

WSU Global Campus offers online bachelor's and master's degrees, certificates, virtual and face-to-face activities and events for students and alumni, continuing education programs for professionals, faculty training in the use of technology in online and on-campus courses, and has a conference management division that facilitates educational programs nationwide.

The Global Campus extends the land grant mission of the University by serving residents of Washington and citizens of the world who cannot or choose not to attend classes on a physical WSU campus.

Degrees and Certificates Offered through WSU Global Campus

A degree earned at WSU Global Campus is the same as a degree earned on a WSU physical campus. WSU faculty teach online courses and WSU staff provide advising and student support services.

The Global Campus works in partnership with WSU academic departments and colleges to deliver WSU quality undergraduate and graduate degrees and certificates online to students around the globe.

Undergraduate Degrees

Business Administration, BA
(Majors: Accounting; Management; and Management Information Systems)
Criminal Justice and Criminology, BA
Data Analytics, BS
Hospitality Business Management, BA
Human Development, BA
Humanities, BA
Psychology, BS
Social Sciences, BA

Graduate Degrees

Agriculture, MS
Education:
(Specializations: Special Education, EdM, MA; and Sport Management, MA)
Electrical Power Engineering, PSM
Engineering and Technology Management, METM
Molecular Biosciences, PSM
Software Engineering, MS
Strategic Communication, MA

Professional Degrees

Business Administration, MBA

Certificates

Bioethics
Business:
(Finances; Marketing; and International Business)
Engineering and Technology Management:
(Constraints Management; Construction Project Management; General Engineering Management; Manufacturing Leadership; Project Management; Six Sigma Quality Management; Supply Chain Management; and Systems Engineering Management)
Human Services Case Management and Administration
Molecular Biosciences
Sustainable Agriculture

Student Life

Students attending WSU's Global Campus can engage in activities and events similar to those enjoyed by on-campus students, including virtual career fairs, academic showcases, art exhibitions, musical performances, common reading programs, and webinars featuring content experts from WSU. The Global Campus student government hosts face-to-face events around the state and graduation celebrations in Pullman and the Seattle area. Students also have access to free e-Tutoring, virtual mentors, personal academic advisors and an online exam proctoring service.

Professional Development

Non-credit online professional development programs also offer students a connection with real-world audiences and issues of importance to society. Lifelong learners can take advantage of non-credit online courses and certificate programs, to keep current in their professions.

Faculty Technology Tools

The Global Campus is committed to helping faculty use technology in their on-campus and online courses to engage students, be more effective and efficient, and improve learning outcomes. The Global Campus is part of Academic Outreach and Innovation, which organizes faculty-led workshops and manages the Technology Test Kitchen through its Learning Innovations program. The Global Campus eLearning professionals have developed a comprehensive Website, <http://teach.wsu.edu>, which offers online tutorials, face-to-face and online training in a variety of tools and technology, online teaching certification, a showcase of interactive learning experiences, and additional resources to assist faculty.

Conference Management

The Global Campus also includes a Conference Management unit that provides educational programs for professionals in the workplace nationally and internationally. Customized programs are created by WSU faculty and outside content experts, in partnership with Conference Management staff, to provide up-to-date knowledge and skills to professionals in business, industry, education, government, non-profit organizations, and trade associations. WSU students are often frequently offered opportunities to attend and participate in these educational programs for working professionals, providing connections to real-world experiences that enhance the students' learning environment.

NORTH PUGET SOUND AT EVERETT

Paul Pitre, Dean
2000 Tower Street MS #45
Everett, WA 98201
425-405-1600
<http://everett.wsu.edu>

WSU North Puget Sound at Everett is the newest expansion of the WSU system. Focused on Science, Technology, Engineering, and Mathematics (STEM), WSU Everett offers baccalaureate-completion degrees to transfer students in Snohomish, Island, and Skagit counties. Students can fulfill general education requirements by taking their first two years of courses at any community college, and then finish their degree by enrolling at WSU in Everett for their junior and senior years.

Our programs are targeted to the industry needs of the region. WSU is advancing and preparing the North Puget Sound region to meet the growing need for STEM degree employees. Beginning in fall 2012, WSU Everett started the first cohort of 23 Mechanical Engineering students, joining six partner universities at the Everett University Center. July 1, 2014, Washington State Legislature appointed WSU management of the Everett University Center. Along with the management of Everett University Center, WSU Everett increased bachelor degree offerings to four and increased enrollment.

Expansion is strong at WSU Everett, with anticipated enrollment by fall 2016 of more than 200 students, the planned addition of two new bachelor programs, Software Engineering and Data Analytics, and the new WSU Everett building opening in fall 2017. As of spring 2016, 33 percent of WSU North Puget Sound at Everett students are the first in their family to attend college, 26.7 percent are ethnic minorities, 10 percent are military veterans, nearly 40 percent are Pell Grant eligible students (lower income) and four percent are international students.

Degrees and Certificates Offered at North Puget Sound at Everett

Undergraduate Degrees

Communication, BA
(Major: Strategic Communication, Option: Integrated Communication)
Data Analytics, BS

Electrical Engineering, BS
Hospitality Business Management, BA
Mechanical Engineering, BS
Software Engineering, BS

Students who earn a degree at WSU Everett will be taught identical curriculum by research-active faculty. None of the diplomas earned at any of the WSU campuses are campus specific - they are Washington State University degrees.

All four bachelor degrees can be a minor in conjunction with one of the other four as a major, and there are select minor degrees available to WSU Everett majors through WSU Global campus courses.

Campus and Student Life

WSU Everett is an intimate campus with numerous advantages. Small class sizes and cohort-based programs give students the opportunity to form a strong support system and build lifelong friendships with other students and the instructors. There are many opportunities for students to participate in group projects, which include local businesses assisting students in developing a network for future employment opportunities. WSU Everett currently has four clubs, many activities and campus events for students to participate in throughout the year.

Currently located on the Everett Community College campus, students have easy access to a local gym and library, study areas, engineering laboratories and computer lab. In fall 2017, the opening of the new WSU Everett's 95,000 square foot building will offer state-of-the-art classrooms, computer labs, engineering laboratories, student collaboration areas, study areas, a coffee shop, fully accessible staff to assist in all academic areas of need and a tutoring center.

The city of Everett offers a wide variety of restaurants, community events, sporting events, a beautiful view of Puget Sound and the Everett marina, and easy access to Seattle and Canada by being situated directly off I-5. Snohomish County offers sports programs, hiking, camping, boating, fishing, art shows, county fairs, museums, shopping and a rich history found in every city.

Industry-Aligned Programs

WSU's presence in Everett is about more than higher education – it will help address the region's most pressing economic challenges as we compete in a worldwide marketplace. Local businesses, large and small, rely on an economic infrastructure of industrial, commercial and professional services. Those businesses need a talented, well-trained workforce to thrive and expand. As such, WSU has close ties to employers in the region to better facilitate internships and local employment for our students after graduation.

SPOKANE CAMPUS

Lisa Brown, Chancellor
WSU Spokane
Academic Center
600 N. Riverpoint Blvd
Spokane, WA 99202
509-358-7978
<http://spokane.wsu.edu>

As Washington State University's health sciences campus, WSU Spokane prepares future nurses, pharmacists, other healthcare professionals and soon, physicians, and engages in world-class research that leads to healthier people and communities.

Degrees and Certificates Offered at WSU Spokane

WSU Spokane offers graduate and baccalaureate completion programs and advanced professional studies in a variety of disciplines, with a strong focus on the health sciences and professions.

The campus is home to three of the 11 WSU colleges: the College of Medical Sciences, the College of Nursing, and the College of Pharmacy.

The newly established College of Medical Sciences encompasses medical education and research. From 2008-2015, WSU Spokane educated first-year medical students as part of the WWAMI program, a partnership between universities and governments of the five participating states (Washington, Wyoming, Alaska, Montana, and Idaho) to make medical education accessible to Northwest students. In the spring 2015, WSU Spokane began pursuing

accreditation of a WSU Medical school and will begin recruiting students when it receives preliminary accreditation. The accrediting body will issue a report after visiting WSU Spokane the summer of 2016. The college also houses the Department of Speech and Hearing Sciences, which offers an undergraduate degree completion program and a graduate program for aspiring speech-pathologists.

The WSU College of Nursing educates more than 900 upper-division undergraduate and graduate-level nursing students each year across its five sites statewide. The college graduates the most bachelor-prepared nurses in the state through its bachelor of science in nursing (BSN) program and its RN to BSN program for licensed registered nurses. The college also offers graduate programs that prepare nurses to become advanced practitioners and nurse educators, leaders, and scholars. These include the master of nursing (MN), doctor of nursing practice (DNP), and PhD programs. Also offered is a master of health policy and administration program that prepares students for leadership roles in health care management.

The WSU College of Pharmacy offers a four-year doctor of pharmacy (PharmD) professional degree program, as well as a PhD in pharmaceutical sciences. The college also has a new satellite PharmD program in Yakima that began classes in fall 2015.

Also offered in Spokane is a bachelor completion degree in nutrition and exercise physiology; and a master's degree, coordinated program in dietetics, nutrition and exercise physiology and a master's degree in criminal justice and criminology. In addition, the campus offers advanced degrees in education with a focus on educational leadership. They include master's, doctoral, and certificate programs for aspiring principals, program administrators, and superintendents, as well as a Master of Teaching program. WSU education faculty play a leading role in the preparation of high school students for health sciences careers. Through an affiliation with Project Lead the Way (PLTW), they help area middle and high schools to implement PLTW's hands-on biomedical science curriculum.

Undergraduate Degrees

Interior Design, BA
Nursing, BS
Nutrition and Exercise Physiology, BS
Speech and Hearing Sciences, BA

Graduate Degrees

Coordinated Program in Dietetics, Nutrition, and Exercise Physiology, MS
Criminal Justice and Criminology, MA
Education:
(Specializations: Curriculum and Instruction, MA; Educational Leadership, EdD, EdM, MA; Special Education, EdM; and Teaching, elementary or secondary, MIT)
Health Policy and Administration, MHPA
Nursing:
(Specializations: Advanced Population Health, DNP, MN; Family Nurse Practitioner, DNP; and Psychiatric Mental Health Nurse Practitioner, DNP)
Nutrition and Exercise Physiology, MS, PhD
Pharmaceutical Sciences, MS, PhD
Prevention Science, MS, PhD
Speech and Hearing Sciences, MS

Professional Degrees

Business Administration, MBA
Doctor of Pharmacy, PharmD

Certificates

Global Justice and Security
Nursing:
(Family Nurse Practitioner; Nursing Educator; Nursing Leadership; and Psychiatric Mental Health Nurse Practitioner)

Learning Opportunities

Health sciences students at WSU Spokane are encouraged to adopt a team-based approach to health care. They are given opportunities to learn side by side with students from other health disciplines. This includes health fairs with health screenings and other community service opportunities, as well as

the annual interprofessional Health Care Team Challenge, an event in which teams of future health professionals compete to develop the best care plan for patient volunteers.

Students can take advantage of a wide variety of clinical placements and internship options through campus partnerships with the health care community in the Spokane area. These options will be expanded with the addition of an on-campus community clinic—slated to open in 2016—that will provide opportunities for students to hone their skills in an interdisciplinary setting.

Students also enjoy opportunities to participate in the laboratory and clinical research conducted at WSU Spokane in the areas of sleep and neuroscience, molecular biology, genetics, neuropharmacology, addictions, diabetes, and kidney disease, among others.

Campus Resources

WSU Spokane's 50-acre campus in the University District is close to the downtown core and bordered by the scenic Spokane River and Centennial Trail.

The growing campus features modern buildings that house state-of-the-art classrooms, labs, and clinics. The newest campus building, the \$78.6 million Pharmaceutical & Biomedical Sciences Building, opened its doors for the spring 2014 semester. The building serves as a research and teaching facility for the Colleges of Pharmacy and Medicine. The new Spokane Teaching Health Clinic opening in 2016 will have faculty and students from all disciplines working together to care for an underserved patient population.

Student Life

Students at WSU Spokane range from full-time, traditional students to working adults balancing family responsibilities and community involvement with their studies. Close to 1,500 students from across the nation and around the world choose WSU Spokane as their destination. The Associated Students of Washington State University Spokane (ASWSUS) and many student clubs provide leadership and service opportunities. ASWSUS also offers a variety of activities and programs to encourage social interaction and create a sense of connection to the city, such as discounted tickets to concerts and sporting events, fitness memberships, tailgates and BBQs, ski trips, and other recreational outings. They also sponsor a program that provides students with help finding housing and another one that gives students free transportation on Spokane Transit Authority's bus system.

Student Support Services

WSU Spokane Student Affairs staff members are committed to enhancing the student experience and providing assistance with a variety of needs. Services offered include academic and writing support; personal and career counseling; international student services, housing assistance, financial aid, accommodation for disabilities, and admissions and enrollment.

TRI-CITIES CAMPUS

H. Keith Moo-Young, Chancellor
WSU Tri-Cities
2710 Crimson Way
Richland, WA 99354-1671
509-372-7000
<http://www.tricity.wsu.edu>

Washington State University Tri-Cities (WSUTC), located in Richland, Washington, delivers undergraduate and graduate education to students from around the world. As a signature campus in the Washington State University family, WSU Tri-Cities is proud to be the campus of choice for STEM education delivered to students through a high impact poly-technic approach.

Degrees and Certificates Offered at WSU Tri-Cities

Choose among a variety of courses and fields of study leading to 18 bachelors', and eight master's degrees. Doctoral programs are officially offered through the Pullman campus; however, faculty at WSU Tri-Cities participate in the graduate program, offer classes and supervise graduate student research. See a complete list on the WSU Tri-Cities website.

Undergraduate Degrees

- Business Administration, BA
(Majors: Accounting; Business Administration; and Management)
- Civil Engineering, BS
(Options: Environmental Engineering; and General)
- Computer Science, BA, BS
- Digital Technology and Culture, BA
- Earth and Environmental Science, BS
(Major: Environmental and Ecosystem Sciences)
- Elementary Education, BA
- Electrical Engineering, BS
- English, BA
(Options: Literature; and Professional Writing)
- History, BA
- Hospitality Business Management, BA
(Majors: Hospitality Business Management; and Wine Business Management)
- Humanities, BA
(Options: English; History)
- Integrated Plant Sciences, BS
(Major: Viticulture and Enology)
- Mechanical Engineering, BS
- Nursing, BS
- Psychology, BS
- Science, BS
(Options: General Biological Sciences; General Mathematics; and General Physical Sciences)
- Social Sciences, BA
(Options: Anthropology; History; Psychology; and Sociology)

Graduate Degrees

- Computer Science, MS
- Education:
(Specializations: Curriculum and Instruction, MA; Educational Leadership, EdD, EdM; English Language Learners, EdM; and Literacy Education, EdM)
- Electrical Engineering, MS
- Environmental Engineering, MS
- Environmental Science, MS
- Teacher Leadership, EdD
- Mechanical Engineering, MS
- Nursing:
(Specializations: Advanced Population Health, DNP, MN; Family Nurse Practitioner, DNP; and Psychiatric Mental Health Nurse Practitioner, DNP)

Professional Degrees

- Business Administration, MBA

Certificates

- Education:
(Administrative Credentials; Endorsements; and Teacher Professional Certification Program)
- Global Leadership
- Human Development:
(Early Childhood Education; Family Studies; and Gerontology)
- Molecular Biosciences
- Nuclear Engineering
- Nursing:
(Family Nurse Practitioner; Nursing Educator; Nursing Leadership; and Psychiatric Mental Health Nurse Practitioner)
- Organic Agriculture
- Professional Writing

Faculty and Research

The strength of an institution lies in the quality of the faculty and academic programs. At WSU Tri-Cities you are invited to engage in rigorous and relevant coursework and experiential learning. We focus on hands-on, relevant, and team-based problem solving.

Here you will work closely with a world-class group of faculty who will know you personally and are committed to your success from the day they enter the classroom to when your name is called at graduation.

Campus Life

The campus is set along the scenic Columbia River in Richland, Washington. The arid desert region is known for its sunny, dry weather. The hot summers and brisk winters allow for outdoor adventures year round, from water recreation to biking along the 22-mile Sacagawea Heritage Trail that runs along the campus.

Community Partnerships

At Washington State University Tri-Cities, students conduct research and complete projects while working with and learning from nationally and world-renowned professors who have ties to a variety of world-class organizations in the local Tri-Cities community. WSU Tri-Cities partners with the same organizations, some of which include Pacific Northwest Laboratory, Hanford Site contractors, ConAgra Foods and Energy Northwest, to provide students with opportunities for internships, co-ops and other extracurricular learning opportunities. These opportunities provide students with the career skills they need to supplement their education, as well as ensure they are career-ready by graduation.

VANCOUVER CAMPUS

Emile “Mel” Netzhammer, Chancellor
14204 NE Salmon Creek Avenue
Vancouver, WA 98686
360-546-WSUV (9788)
<http://vancouver.wsu.edu>

Washington State University Vancouver is the only four-year research university in Southwest Washington. It offers a small-college atmosphere for a public-university price. With more than 3,300 students, WSU Vancouver is the largest of WSU's urban campuses and offers the most programs and degrees.

Degrees and Certificates Offered at WSU Vancouver

Choose among a variety of courses and fields of study leading to bachelor's, master's, and doctorate degrees. Note that courses may be taken toward the completion of an PhD in Education, with a math and science specialization. See a complete list on the WSU Vancouver website.

Undergraduate Degrees

- Anthropology, BA
- Biology, BS
- Business Administration, BA
(Majors: Accounting; Business Administration; Entrepreneurship; Finance; Management; Marketing; and MIS)
- Computer Science, BS
- Data Analytics, BS
- Digital Technology and Culture, BA
- Earth and Environmental Science, BS
(Major: Environmental and Ecosystem Sciences)
- Education, BA
- Electrical Engineering, BS
- English, BA
(Options: Creative Writing; Literary Studies; Rhetoric and Professional Writing; and Teaching)
- History, BA
- Hospitality Business Management, BA
- Human Development, BA
- Humanities, BA
(Options: Anthropology; History; Political Science; Psychology; Sociology; Digital Technology and Culture; Criminal Justice; Personnel Psychology/Human Resources; Public Affairs; and Women's Studies)
- Mechanical Engineering, BS
- Neuroscience, BS
- Nursing, BS
- Psychology, BS
- Public Affairs, BA
- Social Sciences, BA
(Options: Digital Technology and Culture; English; Fine Arts; Foreign Languages and Culture; History; Women's Studies)
- Sociology, BA

Graduate Degrees

Computer Science, MS

Education:

(Specializations: Curriculum and Instruction, MA; Educational Leadership, EdD, EdM; English Language Learners, EdM; Literacy Education, EdM; Special Education, EdM, MA; and Teaching, elementary or secondary, MIT)

Environmental Science, MS

History, MA

Mechanical Engineering, MS

Nursing:

(Specializations: Advanced Population Health, DNP, MN; Family Nurse Practitioner, DNP; and Psychiatric Mental Health Nurse Practitioner, DNP)

Prevention Science, MS

Public Affairs, MPA

Teaching, MIT

Professional Degrees

Business Administration, MBA

Certificates

Business: Professional Sales; Stakeholder Leadership

Education:

(Administrative Credentials; Endorsements; and Field-based Superintendent Certification Program)

English:

(Professional Science and Technology Writing; and Professional Writing)

Human Development:

(Early Childhood Education; Family Studies; Gerontology; and Human Services Case Management and Administration)

Nursing:

Family Nurse Practitioner; Nursing Educator; Nursing Leadership; and Psychiatric Mental Health Nurse Practitioner)

Faculty and Research

More than 160 Ph.D. faculty at WSU Vancouver provide quality instruction and expertise in such diverse topics as artificial intelligence, drug abuse, environmental regulation, hearing loss, workplace behaviors, and computer-aided engineering. The 14:1 student-faculty ratio allows for rich interaction and individual attention.

Campus and Student Life

Located on 351 scenic acres just 10 miles north of Portland, Ore., the WSU Vancouver campus features not only state-of-the-art buildings and student gathering places, but also a system of biking and walking trails with scenic views of Mount Hood and Mount St. Helens.

An active student government and more than 50 student clubs make it easy for students to connect with each other. There are literally hundreds of events and activities for students to choose from each year. Campus centers—Access, Career Services, Student Diversity and Veterans—provide support networks for students.

Community Partnerships

WSU Vancouver is committed to engaging with its community. Community activities include:

The Business Growth Mentor & Analysis Program: Part of the Carson College of Business, Business Growth MAP provides pro-bono, student-conducted analysis and consulting services to small businesses. Students gain experience while helping businesses grow and prosper. The program contributes to the economic development of Southwest Washington and the Portland metropolitan area.

Technology and civic engagement: WSU Vancouver's Creative Media and Digital Culture Program exemplifies the collaborative and inventive efforts of students, technology, and local businesses. Students have partnered with the Fort Vancouver National Historic Site, Dick Hannah Dealerships, Mount St. Helens Institute, and the Oregon Museum of Science and Industry to create mobile apps and video interfaces that provide park and museum visitors with an enhanced, interactive experience.

The Institute for Public Deliberation: A joint venture of the WSU Foley Institute for Public Policy and Public Service and WSU Vancouver, The Institute for Public Deliberation prepares students to facilitate civic conversations. Partnering with 500,000 Voices of Southwest Washington, public affairs students lead and promote development of a vibrant, deliberative democracy, providing discussion of community values and beliefs as related to local, state, and national issues.

YAKIMA

NURSING

Sandy Carollo, PhD, MSN, FNP-BC, Campus Director

1401W. Prash Ave, Yakima, WA 98902

509-494-7900

<https://nursing.wsu.edu/college-of-nursing-yakima/>

The College of Nursing in Yakima is located adjacent to the Allied Health building and Sundquist Hall on the Yakima Valley Community College (YVCC) campus. In keeping with its mission to offer excellent academic programs with educational institutions and community stakeholders, the College of Nursing Yakima site admits students to the Bachelor of Science, Nursing program, and works collaboratively with Master in Nursing, and Doctor of Nursing Practice Program students. Students who attend classes and complete clinically-based learning experiences in Yakima have unique opportunities to participate in the transformation of healthcare. This transformation includes evaluation of our healthcare models and initiatives to impact community and rural health. The Yakima Campus College of Nursing has been actively engaged with a number of other health institutions and disciplines to develop and enhance collaborative learning opportunities through expansion of Interprofessional Education (IPE), with the ultimate goal to impact healthcare for our community.

PHARMACY

Angela Stewart, Assistant Dean

200 University Parkway, Yakima, WA 98901

509-249-7923

<http://pharmacy.wsu.edu/prospectivestudents/pharmacyaboutyakima.html>

The WSU Doctor of Pharmacy program in Yakima offers students the unique experience of being educated on the Pacific Northwest University (PNWU) campus along with the medical students in the PNWU Doctor of Osteopathic Medicine program.

This collaboration with PNWU follows the College's vision to be a leader in protecting, promoting and improving human health, and its mission to develop outstanding healthcare professionals. The goal of the Yakima extension of the Doctor of Pharmacy program is to prepare pharmacists to be members of interprofessional health care teams and to care for patients in new and different ways to match the evolving health care landscape, ultimately expanding the availability of health services to underserved populations in rural settings.

Degrees Offered at Yakima

Undergraduate Degrees

Nursing, BS

Professional Degrees

Doctor of Pharmacy, PharmD



Summary of Academic Policies

Further detail about many of these policies may be found in the appendix of this document in the Academic Regulations section.

Registration

Instructions for registration are available at <http://registrar.wsu.edu/>. Detailed policies are included in the academic regulations, Rules 47-69.

Students may add course enrollments through the fifth day of the semester. After the fifth day of the semester, students may add course enrollments only with the permission of the instructor.

Students may drop courses without record up to the end of the 30th day of the semester, or according to a prorated schedule for shorter academic terms.

Undergraduate or professional students may withdraw from individual courses after the 30th day of the regular term up through the end of the 13th week, with provisions (see Rule 68). Graduate students who wish to request a course withdrawal after the 30th day must do so through the Graduate School.

Students who wish to withdraw from the institution and disenroll from all of their classes initiate the cancellation online through the Registrar's Office website, cancel.wsu.edu.

Class Attendance

Students who have not attended class and laboratory meetings during the first week of the semester may be dropped from the course by the department. (Students should not assume that they have been dropped without verification from the department or Registrar's Office). Students having extenuating circumstances which prevent their attendance during the first week should notify the Office of Student Affairs. Student Affairs will notify instructors of the absence and the reason for it. Valid reasons for missing classes do not relieve the student of making up the work missed. See Appendix, Rules 71-73.

Enrollment Limit

The average semester credit load for undergraduate students is 15 or 16 credit hours. Students are not normally advised to enroll for more than 18 credit hours. When warranted, students may enroll for credits in excess of this limit. Students will not be allowed to enroll for 23 or more hours (10 hours for summer session) without written overload approval from their major department chair or Academic Success and Career Center advisor. (See Tuition and Fees for additional credit hour charge over 18 hours.)

CougarCard

The CougarCard is the official WSU photo ID card. New students receive their CougarCard during New Student Orientation. The CougarCard is required for library privileges, obtaining and cashing checks, riding Pullman Transit and commuter buses, entry to the Student Recreation Center, access to WSU athletic events with a valid sports pass, and admission to many other University events and activities. Additional uses include Cougar CASH accounts, University dining accounts and access to certain campus buildings and offices.

Credit

Washington State University operates on the semester calendar. Each semester is 15 weeks long, plus one week of final examinations. 1 semester hour of credit is assigned in the following ratio of component hours per week devoted to the course of study: (1) lecture—1 hour of lecture per week for each credit hour; (2) laboratory—3 hours of laboratory per week for each credit hour; (3) studio—2 hours of studio work per week for each credit hour; (4) ensemble—4 hours of ensemble work per week for each credit hour. The proportion of time in each course assigned to lecture, studio, laboratory, or ensemble is recommended by the faculty of the department offering the course. The term "semester hour" corresponds with "credit," "hour," or "credit hour" and is abbreviated to "hour" in the description of courses in this catalog. See Appendix, Rules 27-30, 33, 34, 121, 123.

Credit Hour Requirements for Full-time Enrollment

The normal load for an undergraduate student is 15 or 16 credit hours per semester. Twelve credit hours per semester is considered a full load for undergraduate students. Ten credit hours is considered a full load for graduate students. (Six hours in summer session is full time for undergraduates; five hours for graduate students.) Part-time students do not share in certain student body privileges such as participation in recognized activities, WSU Health and Wellness Services, and student publications.

Graduate students on half-time teaching or research assistantships are expected to carry 10-12 credits per semester (3-6 in the eight-week summer session). The Graduate School Policies and Procedures Manual explains in detail the requirements for graduate students on appointment or taking examinations at <http://gradschool.wsu.edu/chapter-five-b/>.

Tuition and Fees: Based on credit hour enrollment. See Tuition and Fee information at <http://studacct.wsu.edu/tuitionfees.html>.

Financial Aid: For financial aid purposes, full-time enrollment for an undergraduate student is 12 credit hours and half-time enrollment is considered to be 6-11 credit hours. For graduate students, full-time enrollment is 10 credit hours and half-time enrollment is considered to be 5-9 credit hours. Students planning to enroll less than full-time should contact the Financial Aid Office. In order to maintain financial aid eligibility, students must meet Satisfactory Academic Progress (SAP) requirements for credit hour completion and cumulative grade point average (GPA). The complete SAP policy regarding credit hour completion, GPA, and degree completion time frame is available at <http://fnaid.wsu.edu/>.

Loan Deferments: Deferments on Perkins Loans and Federal Family Education Loans require at least half-time enrollment (6 credit hours) for undergraduate and graduate students. Five credit hours constitute half-time enrollment for a graduate student on a half-time assistantship.

Federal Family Education Loans deferments, after a break in enrollment, require full-time enrollment (12 credit hours for undergraduates; 10 for graduate students). For this purpose, ten credit hours constitute full-time for a graduate student on half-time assistantship.

Student Government: In order to be qualified for election and tenure as a student member of the ASWSU Senate, a candidate shall be a full-fee-paying student and must be and remain in good academic standing.

Veterans Benefits: For veterans benefits, full-time enrollment for a semester for an undergraduate student is 12 hours, three-quarter-time is 9-11 hours, half-time is 6-8 hours, less than half-time is 4-5 credits, and quarter-time is 1-3 credits. For graduate students, full-time enrollment for a semester is 10 hours, three-quarter-time is 7-9 hours, half-time is 5-6 hours, less than half-time is 3-4 credits, and quarter-time is 1-2 credits. Full time enrollment for summer session for undergraduate students and graduate students is based on the number of credits taken and the length of the class. Detailed information on training time eligibility can be obtained from the WSU Veterans Affairs Office.

International Students Holding F-1 and J-1 Visas: The Immigration and Naturalization Service requires that nonimmigrant F-1 and J-1 students be enrolled in a full course of study for the entire semester. (Twelve semester hours for undergraduate students and 10 semester hours for graduate students per semester excluding summer session is considered full-time.) Additional information on these requirements may be obtained from International Programs/International Students and Scholars, Bryan 108, 509-335-4508.

Auditing

No University credit will be allowed for auditing courses. To visit a class more than three times requires official approval and written permission of the instructor is required. An audit fee is charged for other than regularly enrolled full-fee-paying students. See Appendix, Rules 20, 21.

Cancellation of Enrollment

Students wishing to cancel their enrollment must do so during the first five days of the semester to avoid further financial obligation. Cancellation of enrollment (withdrawal from the University) is initiated through the Registrar's Office. See Appendix, Rule 70.

Classification of Students

Undergraduate students who have completed less than 30 semester credits are classified as first-year students, 30-59 1/2 semester credits as sophomores, 60-89 1/2 semester credits as juniors, and 90 and above as seniors.

Post-baccalaureate students are those who have received the baccalaureate degree but have not been admitted to the Graduate School. Sometimes called post-graduates, these students include those completing requirements for a second baccalaureate degree, those taking courses for personal enrichment, and those working toward teacher certification.

Graduate degree students are those admitted to a graduate program in a degree classification on the basis of a specific application to the Graduate School. See Appendix, Rule 25.

Numbering System of Courses

Lower-division

Courses numbered 100-199 inclusive are normally taken by first-year students.

Courses numbered 200-299 inclusive are normally taken by sophomores.

Upper-division

Courses numbered 300-399 inclusive are normally taken by juniors and seniors.

Courses numbered 400-499 inclusive are normally taken by juniors and seniors. These courses may be included in graduate programs provided they are published in the Graduate Study Bulletin and provided they are not specific requirements in preparation for graduate study.

Graduate

Courses numbered 500-599 inclusive are primarily for graduate students.

Qualified seniors may take these courses for graduate credit during their last year or summer session. Other qualified seniors may take these courses for undergraduate credit with permission of their department chair.

Courses numbered 600-800 have as a prerequisite regular student status in the Graduate School.

Professional

Courses numbered 500-800 and designated with a P following the course number are professional courses.

Course Prerequisites

When applicable, prerequisites are listed in this catalog with the specific course prefix and number, preceded by the words: "Course Prerequisite:". Prerequisites may be levels of competence, or courses which a student must have completed, or the standing a student must have achieved before enrolling for a specific course. For example, Calculus II (MATH 172) requires a prereq of Calculus I (MATH 171) with a C or better, meaning that the student may not enroll for MATH 172 until successfully completing MATH 171. Prereqs may also be as general as two semesters of biology or concurrent enrollment. Prereqs may include a level of expertise or a specified major, e.g., students may not enroll in Spanish 310 without first being fluent in Spanish, or students may not enroll in an advanced seminar before achieving senior standing in the major. Recommended prerequisites are listed as well at the end of the course description, preceded by "Recommended preparation".

Questions concerning prerequisites should be referred to the instructor of the course. Students who have not met all prerequisites may be excluded from the course, or the instructor may waive prerequisites based on demonstrated competence or equivalent academic experience.

Field Trip Guidelines

For classes or other instances in which students are expected to participate in field trips, this expectation should be included in the catalog and/or course syllabus. For classes, the reference to the field trip listed in the course syllabus should include any required fees, how travel would be accomplished, alternatives (if any), and the consequences of not participating in the required field trip.

The University's liability coverage is provided by Chapter 4.92 of the Revised Code of Washington (RCW).

University faculty and staff who require and/or oversee official travel by students are responsible for following the Business Policies and Procedures Manual on Student Travel, http://public.wsu.edu/~forms/HTML/BPPM/95_Travel/95.13_Student_Travel.htm.

Certification of a Major

An undergraduate may certify in an academic major upon completion of 24 semester hours and a minimum 2.0 GPA with the approval of the appropriate department chair and notification to the Academic Success and Career Center.

A student who has completed 60 semester hours should be certified in a major. The student initiates the certification procedures at the Academic Success and Career Center (ASCC), acquires the signatures of the academic advisor and the department chair, and returns the signed documents to the ASCC office. Certified majors who wish to transfer to another academic major do so by requesting a change of major card and obtaining the approval and signature of the department chairs of the former major and the new major.

Students who satisfy the minimum University requirements plus any departmental core requirements with the appropriate minimum cumulative GPA are qualified for certification except in those departments whose majors are impacted or whose certification requirements are higher. Consult the departmental section of this catalog for specific departmental requirements.

SPECIAL NOTE ON UNDERGRADUATE CERTIFICATION: Since academic departments may establish additional requirements for those seeking admission to specific programs, students are reminded that admission to Washington State University does not ensure acceptance into any department or program as a certified major and degree candidate. Several academic programs are unable to accept all qualified students. In these situations, and others which may arise in the future, the most highly qualified students will be selected up to the enrollment limits in the specific program.

Departments and programs designated as impacted or those units directed to raise certification standards by external or certifying agencies may require more than the minimum 24 hours for certification and a GPA higher than the minimum 2.0. Academic units may also require completion of one or more specific courses prior to certification. Units must include in their certification requirements a mechanism whereby qualified transfer students can be certified upon admission. These requirements for immediate certification may include standards more rigorous than the minimum requirements, but prior enrollment per se at WSU cannot be a condition for certification of transfer students. See Appendix, Rule 53 - 56.

Minor, Second Major, or Second Baccalaureate Degree

An undergraduate minor or additional major is a supplemental academic award that is awarded at the same time that a student's primary major is completed and the undergraduate degree is conferred. Once requirements for the minor or additional major are met and the student's first undergraduate degree has been conferred and posted to the transcript, the transcript will be updated to show these additional academic awards.

An undergraduate student who has completed 60 semester hours and is certified in a primary major may certify in a minor with the approval of the offering department. A minor requires a minimum of 16 semester hours, 9 of which must be in upper-division course work and taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. Students may not be certified in a minor, or awarded a minor, if it carries the same name as any other current certifications or completed academic awards. This includes current or completed certification in any area of study, such as degrees; majors; or options, concentrations, or sub-plans within the major. However, a student who has earned a minor may be subsequently certified by a department to seek a higher academic award (e.g., a student who has earned a minor in English may later return to seek a degree in English).

An undergraduate student who has completed 60 semester hours and is certified in a primary major may certify in an additional major with the approval of the offering department. An additional major requires completion of departmental requirements for the major, exclusive of University Common Requirements (UCORE). Students may not be certified in an additional major, or awarded an additional major, if it carries the same name as any other current certifications or completed academic awards. This includes current or completed certification in any area of study, such as degrees; majors; options, concentrations, or sub-plans within the major; or other supplemental academic awards, such as minors. However, a student who has earned an additional major may be subsequently certified with departmental approval to seek a higher academic award (e.g., a student who has earned an additional major in Spanish may later return to seek a degree in Foreign Languages, with a major in Spanish).

A student who desires to complete a second baccalaureate degree shall satisfy the second degree program and college requirements and present not less than 150 semester hours of credit. The first bachelor's degree, whether at WSU or at another accredited institution, is understood to fulfill all University requirements for graduation, including the 300-400-level requirements, University Writing Portfolio, the minimum hours for the first degree, as well as the requirements prescribed by the University Common Requirements (UCORE). See Appendix, Rule 54, 118.

Certificates

An officially recorded undergraduate certificate is a document issued by WSU, displaying the WSU seal and president's signature. Certificates are issued to students who have completed a course of study that meets the guidelines and has been approved by the Faculty Senate. To have the undergraduate certificate recorded on the official transcript, the student must be certified in the program and complete the online graduation application. Application fees and deadlines may be found on the academic calendar, at <https://registrar.wsu.edu/academic-calendar/>.

Grading System

Washington State University uses letter grades and the four-point maximum grading scale. The grade A is the highest possible grade, and grades below D are considered failing. Plus or minus (-) symbols are used to indicate grades that fall above or below the letter grades, but grades of A+ and D- are not used. For purposes of calculating grade points and averages, the plus (+) is equal to .3 and the minus (-) to .7 (e.g., a grade of B+ is equivalent to 3.3, and A- is 3.7). Guidelines for grading may be found in Rule 90, listed in the Appendix.

A—4 grade points per credit hour.

B—3 grade points per credit hour.

C—2 grade points per credit hour.

D—1 grade point per credit hour.

F—no credit; 0 grade points. (Credits attempted are calculated in GPA) Fail.

S (Satisfactory)—No grade points (credit not calculated in GPA). Grade given upon satisfactory completion of courses numbered 499, 600, 700, 702, 800, Special Examinations (Rule 15), and other courses duly authorized for S, F grading by the Faculty Senate. (Courses approved for S, F grading are footnoted in the Schedule of Classes.) A, S, or F grades only are used for physical education activity courses. Courses approved for S, F grading may also be graded S at midsemester indicating satisfactory progress.

M (Marginal Pass)—No grade points (credit not calculated in GPA). Grade given only by the College of Veterinary Medicine.

P (Passing)—No grade points (credit not calculated in GPA). A satisfactory grade for a course taken under the pass, fail grading option. Instructors will turn in regular letter grades for all students enrolled in courses under the pass, fail option, but grades will appear on the student's permanent record as P (Passing) or F (Failing).

H (Honors Pass)—No grade points (credit not calculated in GPA). Grade given only by the College of Pharmacy.

I (Incomplete)—No credit or grade points. The term is used to indicate that a grade has been deferred. It is for students who for reasons beyond their control are unable to complete their work on time. All outstanding incomplete work (including grades of I, X, and blank/no grade) must be completed and posted to the official transcript prior to the conferral of the degree. Students have up to the end of the ensuing year to complete the course, unless a shorter interval is specified by the instructor. If the incomplete is not made up during the specified time or if the student repeats the course, the I is changed to an F. (See Rule 34.)

Faculty are required to submit an instructor's Incomplete Grade Report (IGR) to the departmental office for every I given. The IGR must specify conditions and requirements for completing the incomplete, as well as any time limitations less than one year.

U (Unsatisfactory.) Student work demonstrates unsatisfactory performance, failed examination, or unfulfilled requirements in courses numbered 700, 702, and 800.

W (Withdrawal)—No credit or grade points. Used if the student has withdrawn from the course prior to the end of the 13th week, or withdrew from the University prior to the last day of instruction. For undergraduates who enter WSU in fall 1998 or later, the maximum number of WSU withdrawals is 6, not counting withdrawals that result from the cancellation of enrollment. For undergraduates who enter WSU in the fall 2004 or later, the maximum number of WSU withdrawals is 4, not counting withdrawals that result from the cancellation of enrollment. After the 4th or 6th withdrawal, a student may, in exceptional circumstances, submit a petition through the Registrar's Office for an exception to the withdrawal limit. See Appendix, Rule 68.

X (Grade Withheld)—No credit or grade points. Denotes continuing progress toward completion of special problems, research, thesis, or doctoral dissertation, i.e., 499, 600, 700, 702, 800; X grades are converted to S upon satisfactory completion. All outstanding incomplete work (including grades of I, X, and blank/no grade) must be completed and posted to the official transcript prior to the conferral of the degree. An X grade may also be used when no final grade is reported due to instructor's illness or absence. See Appendix, Rule 90, 92, 98-103.

Pass, Fail Grading Options

Pass, fail options are available for undergraduate and graduate students. Specific characteristics of the two options are listed below. During registration, students indicate that they wish to enroll in the course on a pass, fail basis. The advisor's approval is required for undergraduates. Information indicating which students are enrolled on a pass, fail basis will not appear on class lists transmitted to instructors. Instructors turn in regular letter grades for all students, and the Registrar's Office will change all grades of A through D to P for those enrolled pass, fail. The P grades earned by pass, fail enrollees will not be included in computing the GPA; however, F grades earned by pass, fail enrollees will be included in GPA computations. Courses approved for S, F grading (Rule 90f) are excluded from the pass, fail option. Courses approved for S, F grading are footnoted in the Schedule of Classes.

A student may change a pass, fail enrollment to a regular letter-graded enrollment, or vice versa, during the first three weeks of classes. After the third week and through the last day of instruction in a semester (end of the 15th week), a letter-graded enrollment cannot be changed to a pass, fail enrollment.

Undergraduate Pass, Fail Option: A total of six courses may be taken on a pass, fail basis by students initiating and completing work for a baccalaureate degree at Washington State University. No courses designated as meeting University Common Requirements for graduation may be taken pass, fail. No more than two courses may be taken on a pass, fail basis during any given semester. Two courses is the limit for summer session. Students in the College of Veterinary Medicine with advisor approval may enroll for a total of six courses in the professional curriculum on a pass, fail basis, subject to the regulations listed above. Allowances for transfer students are as follows:

Transfer status upon entering WSU	Pass, fail allotment
1-44 credits	six courses
45-59 credits	five courses
60-74 credits	four courses
75-89 credits	three courses
90 and above credits	two courses

Departments and programs may deny their majors permission to take courses on a pass, fail basis in their major field or courses needed to meet departmental requirements.

Departments and programs may refuse to accept courses needed to meet the above requirements if the courses were completed on a pass, fail basis before the student was accepted into the department or program.

Graduate Pass, Fail Option: Class 5 (except those working on a second baccalaureate degree) and Class 6 (graduate) students are eligible to take courses on a pass, fail basis, but such work cannot be in the student's official degree program or used for removal of a specific undergraduate deficiency. Credit hours earned under pass, fail are counted toward assistantship minimum hour requirements. There is no limit on the number of hours a graduate student may take on a pass, fail basis. See Appendix, Rules 50, 90.

Grade Point Average

The student's grade point average (GPA) is computed by dividing grade points earned by the number of credit hours attempted. Grades P and S do not carry grade points, and the credit hours are not calculated into the GPA. Credits attempted for F grades are calculated into the GPA. Transfer and other

nonresident credit is not computed in the Washington State University grade point average.

Course	Credits	Grade	Grade points
ENGLISH 301	3	A	12.0
BIOLOGY 333	3	C-	5.1
SOC 420	3	B+	9.9
MUS 491	2	P	
SOC 499	4	S	

Credit hours attempted (9) divided into total grade points earned (27) = GPA (3.00). Total hours earned: 15.

Note: P and S grades yield no grade points, thus are excluded from the GPA calculation.

Grade Reports

Midterm grades will be submitted for students enrolled in undergraduate courses by 5:00 p.m. on the Wednesday of the eighth week of the fall and spring semesters. The assessment should not be interpreted as a formal grade, but rather as an indication of the student's progress to date. Midterm grades are advisory and do not appear on the student's permanent record, the WSU transcript.

Final grades will be submitted to the Registrar's Office by 5:00 p.m. on the second working day after the close of finals week.

Grades for all students are available online at the zzusis portal.

Transcripts

An official copy of a student's academic record at Washington State University that bears the official seal of the University and the signature of the Registrar is referred to as a transcript. The transcript must include all work taken at Washington State University. Requests for transcripts must be accompanied by the student's signature and a form of payment for the per copy fee. Order forms are available at www.transcript.wsu.edu. Phone orders for transcripts cannot be accepted. For rush service, call 509-335-5330. NOTE: Financial indebtedness to the University will prevent the release of a student's transcript.

Transcripts of secondary or higher education study that have been submitted to WSU as a requisite for admission cannot be returned to the student. Students desiring transcripts from other institutions must order official transcripts directly from the institution at which the work was taken. WSU does not issue or certify copies of transcripts from other institutions. Copies of international transcripts in which WSU possesses the original copy may be requested using the International Transcript Request form, also available online.

Repetition of Courses

Courses completed with a grade of C or above may not be repeated for credit or grade points.

Students may repeat courses in which they have received a grade of C- or below one time at WSU during fall or spring semesters. If a student repeats a course in which an I (incomplete) grade was received, the I grade will be changed to F.

When a student repeats a course and earns another grade, the series of repeats and grades will be retained on the student's official record. However, the last grade only shall be calculated in the cumulative grade point average and contribute to the total number of hours required for graduation.

In determining scholarship for graduation honors, the first grade only shall be used. Repeats by correspondence, extension, or in residence at other institutions must be reported orally or in writing to the Registrar's Office. See Appendix, Rule 34.

Courses Approved for Repeat Credit

Some courses have been approved for repeat credit, i.e., the student may enroll in the same course during a subsequent semester and additional credit and grade points will be accumulated. An example of such a course would be Special Topics in which the course content may vary from semester to semester. Courses approved for additional credit, with maximum credit allowable, if any, will be indicated in the catalog, e.g., may be repeated for credit; cumulative maximum 6 hours. See Appendix, Rule 34.

Cooperative Courses with the University of Idaho

Cooperative courses between Washington State University and the University of Idaho provide enriched educational opportunities for students of both

universities and allow better utilization of supporting resources such as libraries and laboratories. The sharing of faculty and facilities fosters the exchange of ideas and enhances academic ties between the two communities.

Approved cooperative courses offered to WSU students by the University of Idaho and program description are listed in this catalog under the UI Cooperative Courses section as well as online through the WSU Registrar's Office homepage.

WSU Tuition Fee Waiver Program

A tuition fee waiver option is available for eligible individuals who wish to enroll for up to 6 credits for fall or spring semesters or 4 credits for summer. Individuals may enroll in additional credits for fall and spring semesters, but tuition and mandatory fees for only the first six credits associated with the eligible courses are waived. This program is based on availability of space and facilities.

Eligible Individuals (some restrictions apply)

WSU Employees

- Civil Service employees holding half-time or greater appointments and having permanent status by the 10th day of classes (fall and spring semesters).
- Civil Service employees on trial service appointments meeting the above criteria.
- Faculty and Administrative Professional employees holding half-time or greater appointments.
- Employees covered by collective bargaining unit agreements are eligible on the same basis as Civil Service employees unless otherwise defined by the terms of the applicable bargaining unit contracts.

Others:

- Employees of other state of Washington agencies or higher education institutions meeting the WSU employee eligibility requirements above.
- ROTC faculty and staff employed at WSU locations who meet WSU employee eligibility requirements above are eligible on a space available basis.
- Teachers at public common and vocational schools holding or seeking valid endorsements and assignments in state-identified shortage areas.

Individuals Must be Admitted to WSU

Qualified individuals who wish to enroll under this program must follow regular admission procedures and present a completed staff/faculty registration authorization form beginning the first day of classes to the Registrar's Office (or Summer Session Office if for summer). Forms and instructions are available online at www.ronet.wsu.edu under RO Publications or at www.summer.wsu.edu under Faculty and Staff for summer session. Complete information on this fee waiver program can be found in the WSU Business Policies and Procedures Manual online at www.wsu.edu/~forms/PDF/BPPM/60-00.pdf. (Fall and Spring: 60.70 & Summer: 60.73).

Fees

WSU charges each eligible individual a nonrefundable \$5 administrative fee plus any special course and laboratory fees as well as any applicable late registration fees and late fee payment charges. For fall or spring tuition and mandatory fees are charged for any credits in excess of the first six credits associated with the eligible courses.

Other Restrictions

Individualized instruction such as independent study including courses numbered 499, 600, 700, 702, and 800, classes delivered 100 percent online without any on-campus component, internships, tutorials, self-sustaining courses (fall and spring semesters), private lessons, and practicums may not be taken under the fee waivers.

Audit Enrollments

Auditing under the fee waiver is limited to two courses per semester. Laboratory courses may not be audited. The instructor's signature is required for auditing and cannot be obtained prior to the first day of classes. For fall and spring semesters, applicants wishing to audit should report to the Registrar's Office during the first week of classes to obtain the Permission to Audit form.

Applicants wishing to use the fee waivers to audit summer courses should first check with the Summer Session Office to see if they qualify, as special conditions apply. Fee waiver students will be admitted to class on a space-available basis and are responsible for paying a \$5 nonrefundable registration fee, plus any special course fees or other fees as appropriate.

Waiver of Fees for Persons Age 60 and Over

Persons age 60 or over who are residents of the state of Washington may enroll in up to six audit hours per semester for fall and spring only, using a tuition fee waiver obtained at the Registrar's Office. See Audit Enrollment information above for Fee Waiver Program.

Waiver of Fees for Children of Deceased or Totally Disabled Law Enforcement Officers and Firefighters

Students a child of a law enforcement officer or firefighter who lost his/her life or became totally disabled in the line of duty while employed by a any public law enforcement agency or full-time or volunteer fire department in the state of Washington may be eligible for a tuition waiver. Washington State law defines a totally disabled individual for waiver purposed as a person who has become permanently disabled for life by bodily injury or disease and is thereby prevented from performing any occupation or gainful pursuit. To apply visit www.va.wsu.edu or contact the WSU Veterans Affairs Office, French Administration Building Room 346, Pullman, WA, 99164-1035, 509-335-1234 or 509-335-1857.

Credit by Examination

Matriculated students who are currently registered may take a special examination for university credit in a course in which they are not registered. Such credits yield no grade points but may yield credit toward completion of University Common Requirements for graduation. For further information contact the Registrar's Office. See Appendix, Rule 15c.

Honors

President's Honor Roll. An undergraduate student will be named to the President's Honor Roll under either of the following conditions:

- (a) By achieving a grade point average of 3.75 in at least 9 graded hours in a single term at Washington State University.
- (b) By achieving a cumulative grade point average of 3.50 based on at least 15 cumulative hours of graded work at Washington State University, provided that the semester GPA is a 3.0 or better.

Graduation Honors. Candidates for baccalaureate degrees who have completed at least 30 hours of graded work (grades in which grade points are awarded) at Washington State University will graduate summa cum laude if the cumulative grade point average for work completed at Washington State University is 3.90 or better, will graduate magna cum laude if cumulative grade point average is 3.7 to 3.89, and will graduate cum laude if the minimum cumulative grade point average is 3.50 but less than 3.70. The appropriate Latin phrase will be printed on the diploma and on the final transcript. Qualified students electing to participate in the Honors College who complete its requirements satisfactorily, regardless of whether they qualify to graduate summa cum laude, magna cum laude, or cum laude, will receive a certificate of completion and a printed notation on the final transcript. Computation of graduation honors will be done prior to the final semester to allow for publication of the appropriate honors in advance of graduation. However, following the student's final semester, the Registrar's Office will recompute the student's GPA including the last semester's work, and only this computation will determine official graduation honors. See Appendix, Rules 133, 137.

Academic Complaint Procedure

Students having complaints about instruction or grading should refer them first to the instructor. If not resolved, then the student may refer the complaint in writing to the chairperson of the department in which the course is offered by the end of the last day of the following semester (excluding summer term). After the chair's decision, the student or the instructor may appeal to the Dean's Office within 20 business days of the chair's decision. The decision of the dean is the final step. The University Ombudsman is available at any stage for advice or assistance in resolving academic complaints. See Appendix, Rule 104.

Students having complaints about academic advising should refer them first to the advisor. If the complaint is not resolved, then the student may refer the complaint and remedy sought, in writing, to the chairperson or director of the unit to which the advisor reports. After the chair's decision, the student may appeal to the Dean's office within 20 days. The written statement should describe the complaint, indicate how it affects the student, and include the remedy sought from the Dean's office. The decision from the Dean's office is the final step. The University Ombudsman is available at any stage for advice or assistance in resolving advising complaints.

Academic Deficiency

Washington State University expects students to maintain academic standards of excellence and make satisfactory academic progress toward their degree. Undergraduate students are in good academic standing if both their current WSU semester and cumulative grade point averages are 2.00 or above. Students not meeting the criteria above are considered academically deficient. The first time an undergraduate student falls below a 2.00 semester or cumulative grade point average (GPA), he/she must complete an application for Reinstatement to WSU and attend a Reinstatement Seminar/Interview through the Academic Success and Career Center on the Pullman campus, the WSU Global campus, or the designated office on other campuses (Rule 38). An undergraduate student whose cumulative GPA falls below 2.0 any three semesters will be academically dismissed from the University (Rule 39). Students who are dismissed from the University are required to remain out of WSU for one academic year (i.e. two semesters not including summer). Students seeking subsequent reinstatement must provide, as part of the application for reinstatement, additional documentation that demonstrates potential for academic success at WSU. All academic coursework during the time away from WSU is required to be documented and transcripts submitted to the Office of Admissions.

Decertification

An academic department may decertify a certified major who is academically deficient. The department may also decertify a certified major undergraduate student after two semesters where the student's GPA has fallen below the minimum departmental requirements. See Appendix, Rules 56, 38-43.

Student Rights Regarding Education Records

Federal law requires Washington State University to annually notify students currently in attendance at the University of their rights under the Family Educational Rights and Privacy Act (FERPA). Under FERPA, a student has the right to:

1. Inspect and review his or her education records. "Education records" means those records that are directly related to a student and are maintained by Washington State University or by a party acting for Washington State University.
2. Request the amendment of the student's education records to ensure that they are not inaccurate, misleading, or otherwise in violation of the student's privacy or other rights.
3. Consent to disclosures of personally identifiable information contained in the student's education records, except to the extent that FERPA authorizes disclosure without consent.
4. File with the Department of Education a complaint concerning alleged failures by Washington State University to comply with the requirements of FERPA.

Washington State University may release directory information contained in a student's education records. "Directory information" means information contained in an education record that would not generally be considered harmful or an invasion of privacy if disclosed. Directory information includes the following: name (including any former name), local and permanent addresses, telephone numbers, email addresses, major and minor fields of study, participation in officially recognized sports, weight and height of members of athletic teams, dates of attendance, enrollment status (e.g., undergraduate, graduate; full-time or part-time), grade level, status as graduate assistant and assignment, degrees, certificates, and awards received, including the President's Honor Roll, and the most recent previous educational institution attended by the student. Students may request that WSU not release directory information by indicating "restrict address" on WSU's myWSU Portal's address update screen, or by filing a written request with the Registrar's Office by the tenth day of the academic semester. Students may request that the University not release directory information by filing a request with the Office of Payroll Services or online through my.wsu.edu.

The Washington State University policy on student records can be found in the Washington Administrative Code 504-21. A complete text of this policy is available upon request from the Registrar's Office, 346 French Administration Building.

Application for Graduation

A student who has (a) completed all the requirements for an undergraduate or professional degree and (b) satisfied the University Requirements for Graduation and any additional departmental or college requirements with a minimum 2.00 GPA may become a candidate for a bachelor's or professional degree. NOTE:

Financial indebtedness to the University will prevent the release of a student's diploma and transcript. The award of a degree is conditioned upon the student's good standing in the University and satisfaction of all University graduation requirements. "Good standing" means the student has resolved any unpaid fees or acts of academic or behavioral misconduct, and complied with all sanctions imposed as a result of the misconduct. The University shall deny the award of a degree if the student is dismissed from the University based on his or her misconduct (See Rule 45 and the Student Conduct Code).

A graduation application must be submitted before an undergraduate or professional degree can be conferred. Students are eligible to submit the online graduation application when they have completed 90 credit hours and are certified in their major. A graduation fee must be paid at the time of application. Application fees and deadlines may be found on the academic calendar, at <https://registrar.wsu.edu/academic-calendar/>.

Candidates must present a minimum of 120 semester hours of credit for graduation, including a minimum of 40 semester hours of credit in upper-division courses and a minimum of 30 hours earned at WSU for a four-year degree. 500-level courses will count toward the upper-division requirements, but an undergraduate may not be required to enroll in or complete a 500-level course as a requirement for a baccalaureate degree.

A student desiring a second bachelor's degree shall satisfy the second degree program and college requirements and present not less than 150 semester hours of credit to receive the second degree. Credits applied toward a graduate degree may not be used for a baccalaureate degree.

Students are required to earn a C average or better in all work taken at this institution. Any deficiency on transfer credit must be removed by work taken through Washington State University.

For otherwise qualified students with disabilities, individual course requirements or specific requirements within courses may be waived. Waivers of departmental requirements must be approved by the major department. Waivers of specific requirements within courses must be approved by the department teaching the course. A request for waiver of University requirements must be made directly to the Vice Provost for Undergraduate Education or designee and be approved by the student's department chair and college dean. See Appendix, Rule 106.

Catalog Options and Limitations

The University requirements for graduation as published in the catalog in effect at the time of the student's initial enrollment are those which must be met for completion of an undergraduate degree program. University requirements for graduation include the University Common Requirements. For transfer students, the initial enrollment date shall be that upon which the student entered postsecondary education. Subsequent changes in degree requirements, as published in the catalog or amended by the Faculty Senate, may be substituted at the option of the student.

This policy does not apply to major and specific college requirements. All major program and college requirements (including those in a college which does not have separate departmental requirements) are set at the time the student initially certifies the major. Changes in major requirements after the time of certification may apply to all students, provided they neither require a student to enroll in more than a normal complement of credit hours in any semester nor prolong the time necessary to complete degree requirements. Department and program chairs have authority to waive or provide substitute course work for major requirements.

Undergraduates who will not graduate within the normal minimum degree time frame (four years for four-year baccalaureate programs, five for a five-year, and six for a six-year program) have a total of eight years in four-year programs and ten in five- and six-year programs to complete their degrees under their original catalog listing of University graduation requirements. Those who take longer to complete their degrees must meet the University and University Common Requirements for graduation as published in the catalog four years prior to the date of graduation. In addition, if more than four years elapses between certification and graduation, the major and specific college requirements in place four years prior to graduation will apply.

Official name changes in degree titles will go into effect automatically for all students according to the effective date approved by the Faculty Senate. Students currently enrolled and certified in a degree program at the time of a name change will have the privilege of graduating with either the old or the new degree title. The option of selecting the old degree title will originate with the student, and it will be the responsibility of the department, in signing the degree application, to determine whether or not the student is eligible (i.e., when the student certified).

General Catalog

The General Catalog is a comprehensive reference guide for Washington State University students and is available at the website catalog.wsu.edu. It provides an overall view of the programs and courses at the University and the rules that pertain to admissions, registration, and graduation. The online catalog includes the most recent changes to courses and degree requirements that have been approved by the Faculty Senate. For graduate students, catalog information is published by the Graduate School on the website gradschool.wsu.edu/degrees/. Most academic departments and colleges maintain their own web pages with additional information.

All announcements in the General Catalog are subject to change without notice and students assume the responsibility of consulting the appropriate academic unit or advisor for more current or specific information.

The Schedule of Classes is published each semester on the website www.schedules.wsu.edu and gives additional detailed information about courses offered, class hours, and classroom locations, and contains the latest calendar dates, fees, and details on registration.

Statement of Institutional Responsibility

As a general rule, undergraduate students who are certified majors or graduate degree candidates can assume that a degree will be granted if they maintain continuous enrollment and meet all requirements as listed in Academic Regulations, Rules 114-118. However, because of serious reductions in financial support, loss of faculty, or for other significant reasons, the University may from time to time find it necessary to discontinue a degree program. When this occurs, further admission into the degree program will be frozen effective with the official action dropping the degree, and every effort will be made to allow currently enrolled majors and graduate degree candidates to complete their degrees within a reasonable period of time. To facilitate this process, department and program chairs (or the appropriate dean) have the obligation to provide for the individual needs of these students: e.g., (1) students may be encouraged to complete their requirements in similar or related degree tracks; (2) although University Requirements for Graduation and the minimum total hours for the degree may never be waived, the student's major department may waive or substitute departmental degree requirements (approval of the Graduate School required for graduate students); (3) undergraduate students may be allowed to complete remaining requirements at another institution under Rule 114(a) (4) Graduate students may be allowed to take courses or conduct research at another institution when approved by the student's graduate committee and the Graduate School. In all cases, all financial obligations are the responsibility of the individual student involved, except as otherwise noted in this catalog or the Graduate Studies Bulletin.

University Requirements for Graduation

University requirements for the baccalaureate degree have been established by the faculty as an expression of the common degree expectations for all Washington State University graduates. The faculty has established minimum standards in terms of credit hours, grade points, and distribution requirements within the University Common Requirements (UCORE). For complete listing of all the rules pertaining to graduation, see the Appendix, Rules 106-137.

- Hours and grade points**—A minimum of 120 semester hours with a grade point average of 2.0 or better.
- Upper-Division (300-400-level)**—A minimum of 40 semester hours.
- The University Writing Portfolio (Mid-Career Assessment)**—Successful completion of the University Writing Portfolio is a requirement for graduation at WSU. Students must satisfy this requirement once they have earned 60 semester hours. To complete the University Writing Portfolio students must submit three papers they have written as a result of previously assigned college course work and take a Timed Writing Exam consisting of two writing exercises. The University Writing Portfolio must be completed before a student enrolls in an [M] course (see below). Visit www.writingportfolio.wsu.edu for more information.
- Writing in the Major [M]**—Two courses identified as writing in the major [M] must be included in course work taken to meet departmental requirements. Consult the requirements in the department in which you intend to major.
- University Common Requirements (UCORE)**—All students, regardless of major, must fulfill the minimum requirements of WSU's

University Common Requirements (UCORE), which are described below, or of University Honors College. See Appendix, Rules 106-137.

6. **Awarding the Degree**—The award of a degree is conditioned upon the student's good standing in the University and satisfaction of all University graduation requirements. "Good standing" means the student has resolved any unpaid fees or acts of academic or behavioral misconduct, and complied with all sanctions imposed as a result of the misconduct. The University shall deny the award of a degree if the student is dismissed from the University based on his or her misconduct (See Rule 45 and the Student Conduct Code).

College of Arts and Sciences Graduation Requirements

In order to provide a broad-based education in the humanities, social sciences, and sciences, the College of Arts and Sciences require the following in addition to University Requirements for Graduation. The additional college graduation requirements have already been incorporated in the departmental requirements listed in this catalog.

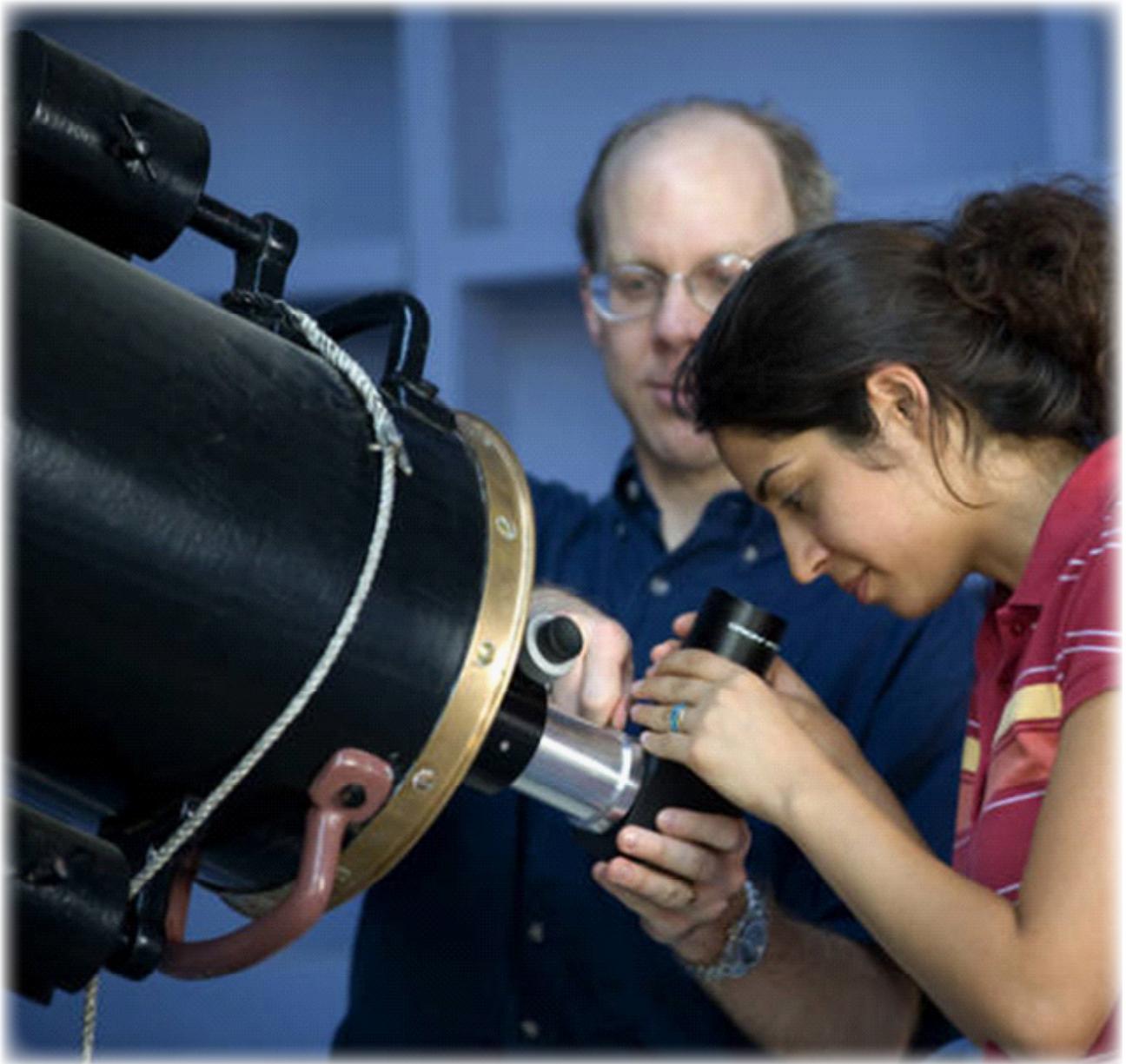
Humanities [HUM], Social Sciences [SSCI], and Creative and Professional Arts [ARTS]—3 credits in addition to the University Common Requirements (UCOREs).

Sciences [BSCI] [PSCI] [SCI]—Additional 1 lab credit of [BSCI] or [PSCI] for a total of 8 semester credits (2 labs) or SCIENCE 101 [SCI] and 102 [SCI].

Foreign Language—Two years of one HS Foreign Language (includes ASL or NAL), or two college semesters (two quarters) of one Foreign Language (includes ASL or NAL), or Foreign language proficiency not based on HS or college instruction. Documentation or testing required for all.

Notes: A foreign language course taken in eighth grade may satisfy one year of the requirement if the second year is completed in high school. If only one year is completed in high school, a WSU student must complete an additional semester (e.g. SPANISH 102) or transfer an additional college-level quarter or semester in the same foreign language. International students who have completed formal instruction in their primary language as well as formal instruction in English as a second language in their secondary education have met the intent of the foreign language requirement. (Records indicating the successful completion of both languages are required to document the foreign language requirement).

Transfer students are responsible for meeting the above requirements. This includes those students holding the approved Associate of Arts or Associate of Science degree from Washington community colleges or Associate of Arts—Oregon Transfer degree from an Oregon community college.



Achieving Academic Success

ACADEMIC ADVISING

Academic advising builds collaborative student-centered relationships that support achievement of personal development and academic success. It is an educational relationship in which students and advisors are partners in planning academic, personal, and career goals.

The Academic Success and Career Center (ASCC) at Washington State University (WSU) helps students create short and long-term plans on which to build the foundation for their education and future careers. All students are required to meet with an academic advisor each semester to discuss academic and career direction. The ASCC offers students a variety of services, programs, and resources to aid in the completion of academic courses, cultivate skill sets, and gain experience marketable to future employers.

The ASCC academic and career advisors and career counselors engage students in critical thinking about career development and required components of a degree at WSU. The ASCC recommends that students gain experiential learning through an internship, summer position, volunteering/community service, and/or study abroad. This provides a strong professional background that enables students to move toward a career, with confidence in the ability to function in a complex, global, and diverse world of work.

WSU academic advisor responsibilities:

- Be accessible, knowledgeable, informed and demonstrate care and respect.
- Guide students as they define and develop realistic goals.
- Teach students decision-making skills and how to assume responsibility to explore their own educational plans, options, and achievements.
- Understand and effectively communicate the curriculum, graduation requirements, and university and college policies and procedures.
- Teach and support students with information about and strategies for utilizing available resources and services on campus and in the community.
- Teach students to understand the purposes and goals of higher education and its effects on their lives and personal goals.

WSU student responsibilities:

- Schedule regular appointments with an advisor (minimum one per semester).
- Clarify personal values and goals and provide the advisor with accurate and truthful information regarding interests and abilities.
- Gather all relevant decision-making information and necessary materials (advisement report, tentative course selections, forms, etc.) to aid in decision making and to build a schedule free of conflicts.
- Prepare a list of questions or concerns before meeting with the advisor.
- Discuss any problems that effect academic performance, for example: study skills, difficulties in course work, time management, personal concerns.
- Ask questions and find out where help is available.
- Know where to access accurate information about educational options, requirements, policies, and procedures.
- Discuss why and how to add or drop courses or to take a course pass-fail or audit.
- Discuss career considerations, changing directions/major/interests.
- Keep a personal record of progress toward academic goals. Be proactive in learning and checking the electronic resources available in myWSU to keep track of academic progress.
- Accept responsibility for decisions and actions that affect your educational progress and goals.

Students are encouraged to take advantage of the skill and knowledge of the advising professionals available. The responsibility of making decisions about personal goals and educational plans ultimately rests with the student.

CHOOSING A MAJOR

Washington State University has nine degree-granting colleges. Colleges are divided into various departments that offer majors. A major is a set of courses that is an in depth study of an academic area.

Choosing a major is an important decision for students. Identifying academic and personal interests and abilities help students narrow the field of choices. From there, selecting courses in different areas enables students to learn more

about a specific major. Choosing a major does not have to be an immediate decision. Often students find a passion while completing University Common Requirements (UCORE) courses, Honors courses, or elective courses. Taking time to investigate different majors and careers is essential to make an appropriate choice. Typically, students are more successful if a chosen major is well-suited to skills and abilities. Further, students who are academically successful are more likely to be competitive in the job market and/or when pursuing graduate degrees. The Academic Success and Career Center (ASCC) assists students in major and career selection through individual career counseling, courses such as College Majors and Career Exploration (UNIV 100), or through various resources within the center.

University Certification Requirements

Entering students may identify an area of interest. Students are assigned an advisor in their major area of interest by the Academic Success and Career Center (ASCC). This advisor can be changed as the student's interest area changes. Students who do not specify a major interest area will be assigned an academic and career advisor in the ASCC.

An undergraduate student may certify an academic major upon completion of 24 semester hours with a 2.0 or better cumulative GPA, with the approval of the department chair. Some departments have additional certification requirements and may require a higher minimum cumulative GPA and require specific courses. Consult the departmental section of the catalog for specific departmental requirements. Admission to Washington State University does not ensure acceptance into any department or program.

Some students choose to complete a minor or second major to enhance their degree program. Formal certification of a minor or second major is completed after completion of 60 semester hours. Approved minors are identified in the departmental section of this catalog. Consult with an advisor or the department for more information.

How is a major related to a career?

Today's workplace is changing rapidly. Most adults change careers several times over the course of their working lives. A well-chosen major will prepare students to do well in many occupations, because it will provide problem-solving, critical thinking, and communication skills necessary to succeed. Some jobs require specific college majors; others do not.

Courses that students complete for their degrees will provide them with skills and knowledge to last a lifetime, no matter how much the workplace may change. As students complete University Common Requirements (UCORE) courses and courses within their college major, they will learn skills that apply to any career:

- Communication skills: how to read, write, speak, and listen effectively.
- Analytical reasoning skills: how to break problems down into their component parts and find solutions.
- Cross-cultural skills: how to assess information about other cultures from a critical and comparative perspective.
- Research skills: how to use the scientific method to explore change and development in the natural world.
- Ethical skills: how to discuss questions of value.
- Aesthetic understanding: how to appreciate works of art.

Take a good look at what is out there

The Academic Success and Career Center (ASCC) has many resources and programs to help students with career planning. Experienced counselors and advisors are available to help with academic major and career decisions. They help students examine values, interests, and abilities, locate current career information, and identify various influences that affect decision-making. Vocational testing can also be arranged. The ASCC also provides information about internship opportunities that can enhance an academic major.

Students should use this catalog and other resources to identify departmental or University Common Requirements (UCORE) courses that sound interesting. Consult with various departments regarding courses or programs that meet interests and abilities. Students may also access departmental information through the WSU homepage at www.wsu.edu. Finally, working carefully with an academic advisor will aid in building a degree at Washington State University.

Undergraduate Degrees, Majors, and Options

The following are the undergraduate degrees offered at Washington State University. Following the degree, majors are listed with bullets, and any options offered within the major are noted in parenthesis. Degrees that are offered exclusively at the regional campuses (Spokane, Tri-Cities, Vancouver, or through WSU Online) are noted. Not all degrees or majors listed are offered at every WSU campus. Students with questions about degree programs should consult with a representative at the specific campus for additional information.

College of Agricultural, Human, and Natural Resource Sciences

Agricultural and Food Systems, Bachelor of Science

- Agricultural and Food Business Economics
- Agricultural Education
- Agricultural Technology and Production Management
- Agriculture and Food Security
- Organic Agriculture Systems

Animal Sciences, Bachelor of Science

- Animal Sciences (options: Animal Management; and Pre-Veterinary Medicine/Science)

Apparel, Merchandising, and Textiles, Bachelor of Arts

- Apparel, Merchandising, and Textiles (options: Apparel Design; and Merchandising)

Economic Sciences, Bachelor of Science

- Economic Sciences (options: Agricultural Economics; Business Economics; Economics, Policy and Law; Environmental and Resource Economics; Financial Markets; International Economics and Development; and Quantitative Economics)

Food Science, Bachelor of Science

- Food Science (options: General; and Fermentation Science)

Human Development, Bachelor of Arts

- Human Development (options: General; and Family and Consumer Science)

Integrated Plant Sciences, Bachelor of Sciences

- Agricultural Biotechnology
- Field Crop Management
- Fruit and Vegetable Management
- Landscape, Nursery, and Greenhouse Management
- Turfgrass Management
- Viticulture and Enology

College of Arts and Sciences

— Arts

Anthropology, Bachelor of Arts

- Anthropology

Asian Studies, Bachelor of Arts

- Asian Studies

Comparative Ethnic Studies, Bachelor of Arts

- Comparative Ethnic Studies

Criminal Justice and Criminology, Bachelor of Arts

- Criminal Justice and Criminology

Digital Technology and Culture, Bachelor of Arts

- Digital Technology and Culture (options: Digital Technology and Culture, Pullman campus; and Creative Media and Digital Culture, Vancouver campus)

English, Bachelor of Arts

- English (options: Literary Studies; Rhetoric and Professional Writing; Creative Writing; Teaching with Certification; and Teaching without Certification)

Fine Arts, Bachelor of Arts

- Fine Arts (BA) (options: Art History; and Studio Fine Arts)

Fine Arts, Bachelor of Fine Arts

- Fine Arts (BFA)

Foreign Languages and Cultures, Bachelor of Arts

- Chinese Language and Culture (options: General)
- French (options: General; and Teaching)
- Japanese (options: General)
- Spanish (options: General; and Teaching)

History, Bachelor of Arts

- History (options: General; Pre-Law; and Teaching)

Humanities, Bachelor of Arts

- Humanities (General Studies options: International Area Studies; Linguistics; Plan A; Plan B; and Religious Studies)

Music, Bachelor of Arts (BA)

- Music

Music, Bachelor of Music (BMus)

- Music Composition
- Music Education (options: Choral / General Secondary Education; Choral / Instrumental / General Secondary Education; Instrumental / General Secondary Education; and Elective Studies in Education)
- Music Performance (options: Brass, Percussion, Strings, Winds; Jazz Studies; Keyboard; Keyboard with Elective Studies in Pedagogy; and Voice)

Philosophy, Bachelor of Arts

- Philosophy (options: General; and Pre-Law)

Political Science, Bachelor of Arts

- Political Science (options: General; Pre-Law; and Global Politics)

Public Affairs, Bachelor of Arts (Vancouver)

- Public Affairs

Social Sciences, Bachelor of Arts

- Social Sciences (General Studies options: Personnel Psychology/Human Resources (Vancouver only); Plan A; and Plan B)

Social Studies, Bachelor of Arts

- Social Studies

Sociology, Bachelor of Arts

- Sociology

Women's Studies, Bachelor of Arts

- Women's Studies

— Sciences

Biology, Bachelor of Science

- Biology (options: General; Botany; Ecology and Evolutionary Biology; Entomology; Pre-Physical Therapy, Pre-Occupational Therapy, and Pre-Physician Assistant; and Teaching)

Chemistry, Bachelor of Science

- Chemistry (options: Materials; Professional; and Teaching)

Data Analytics, Bachelor of Science

- Data Analytics (options: Actuarial Science; Agriculture and Environmental Systems; Business; Computation; Economics; Life Sciences; Physical Sciences; and Social Sciences)

Earth and Environmental Science, Bachelor of Science

- Earth Sciences
- Environmental and Ecosystem Sciences
- Forestry
- Wildlife Ecology and Conservation Sciences (options: Basic; and Pre-Vet)

Mathematics, Bachelor of Science

- Mathematics (options: Actuarial Science; Applied Mathematics; Statistics; Theoretical Mathematics; Secondary Mathematics Teaching with Certification; and Secondary Mathematics Teaching without Certification)

Physics, Bachelor of Science

- Physics (options: Astrophysics; and Standard)

Psychology, Bachelor of Science

- Psychology

Science, Bachelor of

- General Studies, Science (options: Basic Medical; Biological; Mathematical; and Physical)

Zoology, Bachelor of Science

- Zoology (options: General; Pre-Medicine/Pre-Dentistry; and Pre-Veterinary/Animal Care)

College of Business

Business Administration, Bachelor of Arts

- Accounting
- Business Administration (Vancouver and Tri-Cities campuses only)
- Entrepreneurship
- Finance
- International Business
- Management (options: Human Resource Management; and Innovation and Change)
- Management Information Systems
- Marketing

Hospitality Business Management, Bachelor of Arts

- Hospitality Business Management
- Wine Business Management

College of Communication

Communication, Bachelor of Arts

- Communication and Society (options: Communication Technology; Risk and Crisis Communication; and Science Communication)
- Journalism and Media Production (options: Broadcast News; Broadcast Production; and Multimedia Journalism)
- Strategic Communication (options: Advertising; Integrated Communication; and Public Relations)

College of Education

Education, Bachelor of Arts

- Elementary Education
- Specific Subject Secondary Teacher Certificate (primary majors – Agricultural Education; Biology; Chemistry; Earth and Space Science; English Language Arts; Family and Consumer Sciences; French; Health and Fitness; History; Mathematics; Music Education—choral, instrumental, or general; Physics; Social Studies; and Spanish)

Kinesiology, Bachelor of Science

- Health and Fitness
- Sport Science

Athletic Training, Bachelor of Science

- Athletic Training

Sport Management, Bachelor of Arts

- Sport Management

College of Engineering and Architecture

Architectural Studies, Bachelor of Science

- Architectural Studies

Bioengineering, Bachelor of Science

- Bioengineering (options: General; and Pre-Med)

Chemical Engineering, Bachelor of Science

- Chemical Engineering (options: General)

Civil Engineering, Bachelor of Science

- Civil Engineering (options: General)

Computer Engineering, Bachelor of Science

- Computer Engineering

Computer Science, Bachelor of Arts

- Computer Science (BA)

Computer Science, Bachelor of Science

- Computer Science (BS)

Construction Engineering, Bachelor of Science

- Construction Engineering (options: Environmental Facilities; Foundations/Heavy Civil; Infrastructure/Pavement; and Structures/Buildings)

Construction Management, Bachelor of Science

- Construction Management

Electrical Engineering, Bachelor of Science

- Electrical Engineering

Interior Design, Bachelor of Arts

- Interior Design

Landscape Architecture, Bachelor of

- Landscape Architecture

Materials Science and Engineering, Bachelor of Science

- Materials Science and Engineering

Mechanical Engineering, Bachelor of Science

- Mechanical Engineering

Software Engineering, Bachelor of Science

- Software Engineering

College of Medical Sciences (Spokane)

Speech and Hearing Sciences, Bachelor of Arts

- Speech and Hearing Sciences

College of Nursing

Nursing, Bachelor of Science

- Nursing (Third and Fourth years are at Spokane, Tri-Cities, Vancouver, or Yakima)

College of Pharmacy (Spokane)

Doctor of Pharmacy

- Pharmacy

Nutrition and Exercise Physiology, Bachelor of Science

- Nutrition and Exercise Physiology

College of Veterinary Medicine

Biochemistry, Bachelor of Science

- Biochemistry (options: Biophysics; and Molecular Biology)

Genetics and Cell Biology, Bachelor of Science

- Genetics and Cell Biology (options: Molecular Biology)

Microbiology, Bachelor of Science

- Microbiology (options: Molecular Biology; and Medical Technology)

Neuroscience, Bachelor of Science

- Neuroscience (options: Neuroscience; Computational Neuroscience; PreMed/PreDent; and Pre-Veterinary)

Doctor of Veterinary Medicine (DVM)

- Undergraduate majors that prepare for the DVM include, but are not limited to: Animal Science, Biology, Biochemistry, Biosystems Engineering, Genetics and Cell Biology, Neuroscience, Microbiology, or Zoology.

Pursuing an Additional Major

Students who have completed 60 semester hours and are certified in a major may seek to certify in an additional major from the majors listed in the section above. The student should consult with the department offering the major concerning hours and grade point requirements. Once requirements for the additional major are met and the student's first undergraduate degree has been conferred and posted to the transcript, the student's transcript will be updated to show these additional academic awards.

An additional major requires completion of departmental requirements for the major, exclusive of University Common Requirements (UCORES). Note that second degrees have additional requirements. See Rule 118.

Majors Offered Only as Additional Majors

The following additional majors may only be earned in conjunction with a student's primary major and degree. They are not offered as a student's only major.

Additional Major Only
French for the Professions
German for the Professions

Department
Foreign Languages and Cultures
Foreign Languages and Cultures

Japanese for the Professions
Spanish for the Professions

Foreign Languages and Cultures
Foreign Languages and Cultures

Undergraduate Minors

The following are the undergraduate minors offered at Washington State University. The department offering the minor is noted. Minors that are offered exclusively at the regional campuses are noted. Not all minors listed are offered at every WSU campus. Students with questions about degree programs should consult with a representative at the specific campus for additional information.

Students who have completed 60 semester hours and are certified in a major may certify a minor with the approval of the department offering the minor.

A minor requires a minimum of 16 semester hours, 9 of which must be in upper-division course work and taken in taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. Upon completion of the degree, the minor will be posted on the student's permanent record (transcript).

Minor	Department
Addiction Studies (Vancouver only)	Psychology
Aerospace	Aerospace Studies
Aging	Human Development
Agribusiness Economics	Economic Sciences
Agricultural Systems	Agricultural and Food Systems
American Indian Studies	General Studies, Liberal Arts
Animal Sciences	Animal Sciences
Anthropology	Anthropology
Architectural Studies	Design and Construction
Art	Fine Arts
Art History	Fine Arts
Asian Studies	Asia
Astronomy	Physics
Biochemistry	Molecular Biosciences
Biology	Biological Sciences
Business Administration	Business
Business Economics	Economics
Chemistry	Chemistry
Chinese	Foreign Languages and Cultures
Communication	Communication
Comparative Ethnic Studies	Critical Culture, Gender, and Race Studies
Computer Engineering	Electrical Engineering and Computer Science
Computer Science	Electrical Engineering and Computer Science
Construction Management	Design and Construction
Creative Writing	English
Criminal Justice and Criminology	Criminal Justice and Criminology
Crop Science	Crop and Soil Sciences
Digital Technology and Culture	Digital Technology and Culture
Earth Sciences	Environment
Economics	Economic Sciences
Electrical Engineering	Electrical Engineering and Computer Science
Engineering	Engineering and Architecture
English	English
Entomology	Entomology
Entrepreneurship	Business
Environmental and Resource Economics and Management	Economic Sciences
Environmental Science	Environment
Ethics	Philosophy
Film Studies	Foreign Languages and Cultures
Forestry	Environment
French	Foreign Languages and Cultures
French Area and Culture Studies	Foreign Languages and Cultures
Genetics and Cell Biology	Molecular Biosciences
Geospatial Analysis	Crop and Soil Sciences
German	Foreign Languages and Cultures
German Area and Culture Studies	Foreign Languages and Cultures
Global Studies	International Programs
History	History
Horticulture	Horticulture
Hospitality Business Management	Hospitality Business Management

Human Development
Human Resource Management

Human Development
Management, Information Systems, and Entrepreneurship

Humanities	English
Japanese	Foreign Languages and Cultures
Jazz Studies	Music
Latin American & Spanish Area Studies	Foreign Languages and Cultures
Linguistics	English
Materials Science and Engineering	Mechanical and Materials Engineering
Mathematics	Mathematics and Statistics
Mechanical Engineering	Mechanical and Materials Engineering
Microbiology	Molecular Biosciences
Military Science	Military Science
Molecular Biology	Molecular Biosciences
Music	Music
Natural Resources	Environment
Naval Science	Naval Science
Neuroscience	Neuroscience
Philosophy	Philosophy
Physics	Physics
Political Science	Political Science
Popular Culture	Critical Culture, Gender, and Race Studies
Pre-Genetic Counseling	Molecular Biosciences
Professional Writing	English
Psychology	Psychology
Queer Studies	Critical Culture, Gender, and Race Studies
Rangeland Ecology and Management	Environment
Religious Studies	General Studies, Liberal Arts
Sociology	Sociology
Soil Science	Crop and Soil Sciences
Spanish	Foreign Languages and Cultures
Sport Management	Educational Leadership, Sports Studies, and Educational/Counseling Psychology
Statistics	Mathematics and Statistics
Strength and Conditioning	Educational Leadership, Sports Studies, and Educational/Counseling Psychology
Sustainable Development	Economic Sciences
Viticulture and Enology	Horticulture
Wildlife Ecology	Environment
Wine Business Management	Hospitality Business Management
Women's Studies	Critical Culture, Gender, and Race Studies
Zoology	Biological Sciences

Undergraduate Certificates

The following are the official certificates offered at Washington State University. The department offering the certificate is noted. Certificates that are offered exclusively at the regional campuses are noted. Not all certificates listed are offered at every WSU campus. Students with questions about degree programs should consult with a representative at the specific campus for additional information.

An officially recorded undergraduate certificate is a document issued by WSU, displaying the WSU seal and president's signature. Certificates are issued to students who have completed a course of study that meets the guidelines and has been approved by the Faculty Senate. To have the undergraduate certificate recorded on the official transcript, the student must be certified in the program and complete the online graduation application. Application fees and deadlines may be found on the academic calendar, at <https://registrar.wsu.edu/academic-calendar/>.

Certificate Requirements – A certificate requires a minimum of 15 credit hours with the exact number specified by the department offering the certificate. The maximum number of transfer credit hours that may apply towards a particular WSU certificate is ¼ of the total number of credit hours required for the certificate. The number of credit hours that may be taken for a Pass/Fail (or S/F) grade is ¼ of the total number of credit hours required for the certificate. The minimum GPA to earn a certificate is a 2.0.

Certificate	Department
Adolescence	Human Development
American Indian Studies	General Studies
Cougar Athletics Leadership Development	Undergraduate Education
Early Childhood Education	Human Development
East Asian Studies for Business Majors	Asia Program
East Asian Studies for Engineering and Architecture Majors	Asia Program
Editing and Publishing	English
English Language Learners	Teaching and Learning
Family Studies	Human Development
Gerontology	Human Development
Global Competencies	Honors College
Global Leadership	Undergraduate Education
Human Services Case Management and Administration	Human Development
Molecular Biosciences	Molecular Biosciences
Organic Agriculture	CAHNRS
Professional Sales	Business (Vancouver)
Professional Science and Technology Writing	English
Professional Writing	English
Quantitative Biology	Biology/Mathematics and Statistics
Teaching English as a Foreign Language	English

LEARNING ENRICHMENT OPPORTUNITIES

Several departments at Washington State University work closely together to offer support to students as they develop their research and writing abilities—key components of a WSU education. From the first year to the senior year, students may take advantage of all or part of these learning enrichment courses and services, which include:

First-Year Focus Living-Learning Communities – First-Year Focus is a residential living/learning community program in which first-semester students living in the same residence hall are co-enrolled in a UCORE course. Students form classroom connections, instant study groups, and social networks. First-Year Focus eases the transition to college life by creating a solid academic focus enhanced by additional interaction with faculty and residence hall peers. Contact: First-Year Programs, CUE 403, 509-335-5488, <http://firstyear.wsu.edu>.

First-Year Success Seminar – The First-Year Success Seminar (UNIV 104) is a two-credit, small interactive course in which students explore values, set academic and personal goals, and pursue them through reflective writing, core texts, and other course activities. The seminar provides instruction in skills necessary for college success and encourages critical thinking about the connections between the self and others, classroom learning, and the larger world. Students are introduced to integrative learning strategies as well as to the resources and opportunities within the university community that will allow them to excel in the first year. Contact: First-Year Programs, CUE 403, 509-335-5488, <http://firstyear.wsu.edu>.

Seminar in Focused Exploration – University 304 (UNIV 304) is a transition seminar serving upper-division students and transfer students. This seminar is designed to assist students with narrowing down and choosing a good fit major, based on personal passions, purpose, values, strengths and interests. The seminar also supports students with information about their chosen major, what they can do with it, and potential career opportunities. Contact: Academic Success and Career Center, Lighty 180, 509-335-6000.

Veterans Transition Seminar – (specified section of UNIV 304) is designed to assist veterans with their transition from the military to a major research university. Navigating a large university can seem overwhelming at first; this seminar helps veterans settle into their new role as students.

Accessing Information for Research – With sophomore standing and above, students may enroll in UNIV 300, a one-credit course intended to assist them in exploring the technological resources available for conducting academic research. Transfer students who may not be familiar with the resources of the research library are also encouraged to enroll. Contact: Library Instruction Office, Holland Terrell Library, 509-335-7735.

Community Engaged Learning – Students in academic courses across the curriculum are provided with opportunities to learn through engagement in community-based service. Service learning experiences and projects done in collaboration with community partners inform classroom learning, enhance civic awareness, promote personal growth, and foster skill development.

Contact: Center for Civic Engagement, 509-335-7708, cce@wsu.edu, <http://cce.wsu.edu>.

Global Learning – Students from all academic majors are encouraged to incorporate global experiences into their academic programs of study. One way to do this is through an education abroad experience, which includes studying and learning abroad on a WSU Faculty-led program with WSU faculty and other Cougs, taking courses at foreign universities, doing an internship, or conducting service or research internationally. Over 700 students each year take advantage of the opportunity to engage in academic and culturally enriching experiences abroad. Students may also become Global Cougs by earning a Global Leadership Certificate or by participating in the Global Case Competition to enhance their experiences at home and abroad. The Global Learning Department within the Office of International Programs advises all WSU students on all of these opportunities. Contact: Global Learning, ip.globallearning@wsu.edu, 509-335-6204, <http://ip.wsu.edu/>.

Writing Center:

- **Free individual peer tutoring for writing** – Writing Center tutors assist students with writing for all University courses. Free, drop-in tutoring is available in the WSU Writing Center, Smith Center for Undergraduate Education (CUE), Room 303. To check on open hours go to: www.writingcenter.wsu.edu.
- **Writing Tutorial** – ENGLISH 102 and 107 are one-credit courses that offer students who are concurrently enrolled in first-year writing courses opportunities to improve their writing skills. These courses are student-centered group tutorials, facilitated by Writing Center tutors. Contact: WSU Writing Center, Smith Center for Undergraduate Education (CUE), Room 303, 509-335-1323.
- **Advanced Writing Tutorial** – UNIV 302 can be taken concurrently with an M course or upper-division writing-intensive course in the student's major. This advanced course employs a small-group, student-centered approach focusing on students' discipline-specific needs. ENGLISH 202, "Grammar in Context" can be taken concurrently with an M course or upper-division writing-intensive course. This course also employs a small-group, student-centered approach but focuses on issues of grammar and sentence structure. Contact: WSU Writing Center, Smith Center for Undergraduate Education (CUE), Room 303, 509-335-1323.

Learning Assistance

The Academic Success and Career Center (ASCC) provides learning assistance programs for all WSU students.

Wellbeing Workshops – Wellbeing Workshops are scheduled throughout each semester and are open to all WSU students. These workshops focus on academic topics such as tips for test-taking, note-taking, and learning skills. Other topics include stress and time management, how to choose a major, and how to prepare for an academic advising appointment. Students may benefit from the more in-depth look at tips and strategies covered in these workshops. There are also on-line tools designed to get students organized and ready for academic challenges. Students can browse through the Wellbeing Workshops at <http://ascc.wsu.edu> to become familiar with the variety of workshops available.

Tutoring – Tutoring should be sought anytime a student wants to check their understanding of course concepts/lessons or when additional help is needed. The goal of tutoring is to provide students with assistance that enables them to develop academic mastery and independence. During tutorial appointments, students can get help with homework, help with understanding concepts necessary to pass a course, and useful study techniques. Tutoring helps students master course information by providing alternate explanations, techniques, and examples. Tutors are not a substitute for attending class. Students who have taken advantage of tutoring have found that their grades improved. Tutoring should be in addition to the help that is available from professors' and teaching assistants' office hours.

The Peer Tutorial Program provides one-on-one assistance or small group tutoring in a wide range of subjects.

ASCC tutors are trained to meet the requirements of the College Reading and Learning Association's International Tutor Program Certification. New to the WSU menu of tutoring services is eTutoring.org, an online tutoring resource for popular subjects such as math, accounting, and writing. The tutoring website found at <http://ascc.wsu.edu> provides an up-to-date list each semester of free drop-in tutoring services available in ASCC, the Smith Center for Undergraduate Education (CUE), various residence halls, and throughout the university. Contact: Academic Success and Career Center, Lighty 180, 509-335-6000.

Other Learning Assistance Programs

Student Support Services Program (SSS) – SSS is a federally-funded TRIO academic assistance program that assists undergraduate students on the Pullman and Tri-Cities campuses. The SSS program is designed to provide comprehensive academic support on a one-to-one basis focusing on a student's personal, academic, and social success. **Services include:** academic advising, financial literacy and college success workshops, degree and career guidance, free tutoring, mentoring, study skills training, cultural enrichment activities, scholarship opportunities, and referral services. **To be eligible,** students must be enrolled or accepted to WSU, show academic need, and meet one or a combination of the following criteria: first-generation college student (neither parent has received a baccalaureate degree), meet federal low-income guidelines, and/or have a documented disability. All services are provided at no cost to the participant. Interested students must submit a program application. Contact information: PULLMAN: (509) 335-7324, Lighty Building, Room 260, www.sssp.wsu.edu. For students interested in teaching, visit the ATLAS program: (509) 335-4768; Education Addition Building 321; <https://provost.wsu.edu/atlas/>. TRI-CITIES: (509) 372-7122, East Building, Room 203, triostudentsupport@tricity.wsu.edu, www.tricity.wsu.edu/triostudnetsupport.

The College Assistance Migrant Program (CAMP) – The mission for the College Assistance Migrant Program is to provide outreach, academic, supportive, and financial assistance to effectively transition students from migrant and seasonal farmworker backgrounds to successfully complete the first academic year at Washington State University and to continue in postsecondary education. Due to continual mobility, an average CAMP student is faced with academic inconsistencies throughout their primary education. CAMP is specifically designed to identify, recruit, and monitor the academic achievement and retention of migrant students. The College Assistance Migrant Program (CAMP) is a federally funded program. For more information, visit us at Lighty Building Room 260, <http://camp.wsu.edu>, or call 509-335-5782.

Washington Achievers Scholars/Governor's Scholars /Passport to College Programs – Washington Achievers Scholars and Governor's Scholars are low-income and often first generation students who receive a scholarship from the College Success Foundation. Passport to College students are emancipated foster youth who receive support from the College Success Foundation. Achievers, Governor's, and Passport scholars are supported on campus with faculty/staff mentors, academic success workshops, counseling, tutoring, advising, referral services and social events. Contact the College Mentor Coordinator in the Academic Success and Career Center, Lighty 180, <http://ascc.wsu.edu/CSFS>, 509-335-8065.

UI Cooperative Courses

Cooperative Courses with the University of Idaho

Cooperative courses between Washington State University and the University of Idaho provide enriched educational opportunities for students of both universities and allow better utilization of supporting resources such as libraries and laboratories. The sharing of faculty and facilities fosters the exchange of ideas and enhances academic ties between the two communities.

Approved cooperative courses offered to WSU by the University of Idaho are listed below. WSU students desiring to enroll in cooperative courses taught must be degree seeking and eligible to register at WSU.

WSU students can go to the following site, <http://www.uidaho.edu/registrar/registration/coop> to view the cooperative information and application specifically for Washington State University students.

After filling out the UI non-degree cooperative admission application at the UI website listed above and being admitted, the student will receive credentials from UI to register using VandalWeb, UI's student information system.

WSU students will not be charged tuition at UI, but will be responsible for any special course fees.

WSU student credit hours at UI will count toward their enrollment hours at WSU for billing and financial aid.

A UI transcript will be sent to WSU, at the end of the term, without request or fee, and the UI course work will be posted as transfer credit and the appropriate transfer course equivalencies will be given.

UI cooperative classes for WSU Students may be viewed at <http://www.uiweb.uidaho.edu/schedule/>.

Note that the courses listed below may not be available every semester.

Subject	Number	Course Title	Credits
AERO	391	Private Pilot Ground School	2
AERO	392	Instrument Pilot Ground School	2
AGEC	525	Master's Econometrics	3
AGEC	526	Master's Microecon Analysis	3
AGEC	527	Mathematics for Economists	3
AGEC	529	Research Methods	1 to 2
AGEC	532	Natural Recourse Econ/Policy	3
AGEC	533	International Trade and Policy	3
AGEC	534	Production Economics	3
AGEC	535	Applied Industrial Orgnztn	3
AGEC	587	Regional Econ Dev Methods	3
ANTH	411	Human Evolution	3
ANTH	422	Plateau Indians	3
ANTH	511	Human Evolution	3
ANTH	531	Historical Archaeology	3
ARBC	101	Elem Modern Standard Arabic I	4
ARCH	154	Intro to Architectrl Graphics	3
ARCH	421	China Program Preparation	2
ARCH	430	Rome Preparatory Seminar	2
ARCH	521	China Program Preparation	2
ARCH	580	British Green Architecture	2
ASM	107	Beginning Welding	2
ASM	305	GPS and Precision Agriculture	3
ASM	315	Irrig Syst/Water Mgmt	3
ASM	331	Elec Power Syst/Agric	3
AVS	109	Sci/Anim Serve Humanit	4
AVS	172	Princ/Practices-Dairy Science	2
AVS	263	Live Animal & Carcass Evaluatn	3
AVS	305	Animal Nutrition	3
AVS	306	Feeds & Ration Formula	4
AVS	330	Genetics/Livestock Improvement	3
AVS	363	Animal Products/Hum Consumptn	4
AVS	451	Endocrine Physiology	3
AVS	452	Physiology of Reprodctn	4
AVS	466	Equine Science and Management	3
AVS	472	Dairy Cattle Mgmt	3
AVS	474	Beef Cattle Science	3

AVS	475	Advanced Dairy Management	3
AVS	551	Endocrine Physiology	3
BE	441	Instrumentation/Measurements	3
BE	541	Instrumentation/Measurements	3
BE	558	Fluid Mechanic/Porous Material	3
BIOL	416	Plant Diversity and Evolution	4
BIOL	456	Computer Skills for Biologists	3
BIOL	461	Neurobiology	3
BIOL	522	Molecular Evolution	3
BIOL	545	Princ of Systematic Biology	3
BIOL	548	Evolutionary Ecology	3
BIOL	551	Seminar/Reproductive Biology	1
CE	422	Hydraulic Struct Anlys/Design	3
CE	428	Open Channel Hydraulic	3
CE	474	Traffic Systems Design	3
CE	510	Adv Mechanics of Materials	3
CE	521	Sedimentation Engineering	3
CE	531	Environmntl Engr Unit Operatns	3
CE	532	Dsgn Water/Wastewater Systs II	3
CE	534	Envrnmntl Engr Unit Processes	3
CE	541	Reliability of Engr Systems	3
CE	542	Adv Design of Steel Structures	3
CE	543	Dynamics of Structures	3
CE	546	Finite Element Anly	3
CE	547	Adv Reinforced Concrete Dsgn	3
CE	556	Pavement Materials	3
CE	561	Engr Properties of Soils	3
CE	562	Adv Foundation Engr	3
CE	563	Seepage and Slope Stability	3
CE	566	Geot Eq Engineering	3
CE	571	Traffic Flow Theory	3
CE	572	Intersection Traffic Operation	3
CE	573	Transportation Planning	3
CE	574	Public Transportation	3
CE	575	Adv Pavement Design/Analysis	3
CE	577	Pavement Mgmt/Rehabil	3
CHE	515	Transport Phenomena	3
CHE	527	Thermodynamics	3
CHE	529	Chem Engr Kinetics	3
CHE	541	Chem Engr Analysis I	3
CS	324	Computer Graphics	3
CS	438	Network Security	3
CS	510	Programming Language Theory	3
ECE	427	Power Electronics	3
ECE	452	Communication Systems	3
ECE	526	Protection Power Systems II	3
ECE	530	Adv Electromagnetic Theory I	3
ECE	533	Antenna Theory	3
ECE	570	Random Signals	3
ECE	571	Estmntn Thry/Sig Prc/Comm/Cntrl	3
ECE	572	Linear System Theory	3
ECE	579	Engineering Acoustics	3
ECON	527	Mathematics for Economists	3
EDAD	535	School Finance	3
ENGR	210	Engineering Statics	3
ENGR	220	Engineering Dynamics	3
ENGR	320	Engr Thermodynamic/Heat Transfer	3
ENGR	335	Engr Fluid Mechanics	3
ENGR	350	Engr Mechanics of Materials	3
ENT	440	Insect Identification	4
ENT	441	Insect Ecology	3
ENT	490	Special Topics in Entomology	1 to 4
ENT	540	Insect Indentification	4
ENT	541	Insect Ecology	3
ENT	546	Host Plt Resist/Insects-Pathog	3
ENT	549	Insect-Plant Interactions	3

ENT	551	Appl Biol Cntrl:Weeds	1	FS	565	Wine Microbiol/Processing	3
ENT	584	Insect Anat & Phys	3	FS	570	Adv Food Technology	3
ENT	590	Special Topics in Entomology	1 to 4	FS	583	Advances in Cereal Chem & Tech	3
FISH	314	Fish Ecology	3	FS	588	Food Science Tchg Practicum	1 to 3
FISH	418	Fisheries Management	4	FS	598	Internship	1 to 16
FISH	422	Concepts in Aquaculture	4	GEOE	428	Geostatistics	3
FISH	424	Fish Health Management	4	GEOL	407	Basin Analysis	3
FISH	510	Adv Fishery Mgmt	3	GEOL	490	Field Geology II	3
FISH	511	Fish Physiology	2	GEOL	507	Basin Analysis	3
FISH	515	Large River Fisheries	2	GEOL	510	Geosystems	3
FISH	525	Aquaculture/Wild Fisheries	2	GEOL	532	Geol Dev Of North Amer	3
FOR	472	Remote Sensing of Environ	4	GEOL	533	Geodynamics	4
FOR	541	Stable Isotope Thry/Mthds	3	GEOL	541	Structural Analysis	3
FREN	407	French/Francophone Literatures	3	GEOL	542	Advanced Structural Geology	3
FREN	410	French and Francophone Arts	3	GEOL	548	Tectonics	3
FS	110	Introduction to Food Science	3	GEOL	550	Advanced Mineralogy	3
FS	113	Intro to Vines and Wines	3	GEOL	554	Physical Petrology	3
FS	201	Science on Your Plate	3	GEOL	567	Volcanology	3
FS	204	Special Topics	1 to 16	GERM	301	Adv German Grammar	3
FS	220	Food Safety/Quality	3	GERM	420	Topics/Germ Cltre & Lit-Themes	3
FS	302	Food Processing Lab	1	JAPN	101	Elementary Japanese I	4
FS	303	Food Processing	3	JAPN	102	Elementary Japanese II	4
FS	304	Cereal Chemistry & Processing	3	JAPN	201	Intermediate Japanese I	4
FS	329	Dairy Fds Cmpstn & Qlty	4	JAPN	202	Intermediate Japanese II	4
FS	398	Internship	1 to 16	LARC	358	Prof Off Prac Lan Arch	2
FS	401	Industrial Fermentations	3	LARC	389	Hist of Landscape Arch	3
FS	402	Ciders & Other Fermented Foods	3	LARC	559	Northrn Rocky Rgnl Lndscpe	4
FS	403	Workshop	1 to 16	LAW	947	Environmental Law	3
FS	404	Special Topics	1 to 16	MATH	388	History of Mathematics	3
FS	406	Evaluation of Dairy Products I	1	MATH	437	Mathematical Biology	3
FS	409	Princ Environmntl Toxicology	3	MATH	451	Probability Theory	3
FS	416	Food Microbiology	3	MATH	452	Mathematical Statistics	3
FS	417	Food Microbiology Lab	2	MATH	453	Stochastic Models	3
FS	418	Oral Seminar in Food Science	1	MATH	494	Seminar in Mathematical Biolog	1
FS	422	Sensory Eval/Food and Wine	3	MATH	521	Topology I	3
FS	423	Sensory Eval/Food/Wine Lab	1	MATH	528	Differentiable Manifld	3
FS	429	Dairy Products	3	MATH	531	Complex Variables	3
FS	430	Dairy Products Lab	1	MATH	538	Stochastic Models	3
FS	432	Food Engineering	3	MATH	539	Thry Ord Differential Equatns	3
FS	433	Food Engineering Lab	1	MATH	540	Partial Differential Equations	3
FS	436	Principles of Sustainability	3	MATH	541	Seminar in Analysis	1 to 3
FS	460	Food Chemistry	3	MATH	543	Approximation Theory	3
FS	461	Food Chemistry Lab	1	MATH	555	Groups and Fields I	3
FS	462	Food Analysis	3	MATH	556	Groups and Fields II	3
FS	464	Food Toxicology	3	MATH	557	Ring Theory	3
FS	465	Wine Microbiol/Processing	3	MATH	558	Intro to Algebraic Geometry	3
FS	466	Wine Microbiology and Proc Lab	1	MATH	563	Mathematical Genetics	3
FS	470	Adv Food Technology	3	MATH	583	Seminar In Appl Math	3
FS	475	Stat Qlty Mgmt of Food Product	3	ME	414	HVAC Systems	3
FS	489	Food Product Development	3	ME	444	Air Conditioning Engr	3
FS	498	Internship	1 to 16	ME	450	Computational Fluid Dynamics	3
FS	499	Directed Study	1 to 16	ME	472	Mechanical Vibrations	3
FS	503	Workshop	1 to 16	ME	481	Control Systems	3
FS	504	Special Topics	1 to 16	ME	513	Engineering Acoustics	3
FS	509	Princ Environmntl Toxicology	3	ME	514	HVAC Systems	3
FS	510	Functional Foods and Health	3	ME	540	Continuum Mechanics	3
FS	511	Foods Lipids	3	ME	546	Convection Heat Transf	3
FS	512	Food Proteins and Enzymes	2	ME	549	Finite Element Anly	3
FS	513	Food Carbohydrates	3	ME	550	Computational Fluid Dynamics	3
FS	514	Starch Chemistry	3	MTHE	590	Seminar in Math Education	1 to 3
FS	516	Food Laws	2	NS	101	Intro To Naval Science	2
FS	517	Scientific Writing	2	NS	102	Ship Systems I	3
FS	518	Oral Seminar	1	NS	103	Intro to Naval Science Lab	1
FS	520	Instrumental Analysis	2	NS	201	Ship Systems II	3
FS	522	Sensory Eval/Food and Wine	3	NS	202	Seapwr & Maritime Affr	3
FS	529	Dairy Products	3	NS	299	Directed Study	1 to 16
FS	530	Dairy Products Lab	1	NS	301	Navigation	3
FS	532	Advanced Food Microbiology	3	NS	302	Naval Operations	3
FS	536	Principles of Sustainability	3	NS	311	Evolution Of Warfare	3
FS	538	Intro to Physical Prop of Food	2	NS	401	Naval Leadership	3
FS	564	Food Toxicology	3	NS	402	Naval Leadership and Ethics	3

NS	412	Amphibious Operations	3
NS	499	Directed Study	1 to 16
PHIL	320	History Ancient/Medieval Phil	3
PHIL	321	History of Modern Philosophy	3
PHIL	351	Philosophy of Science	3
PHIL	442	Philosophy of Mind	3
PHIL	443	Philosophy of Language	3
PHIL	447	Theory of Knowledge	3
PHIL	470	Philosophy of Law	3
PHIL	510	Sem in the Hist of Philosophy	3
PHIL	520	Seminar/Ethical Theory	3
PHIL	524	Seminar/Epistemology	3
PHYS	465	Particle and Nuclear Physics	3
PHYS	484	Astrophysics	3
PHYS	521	Advanced Mechanics	3
PHYS	533	Statistical Mechanics	3
PHYS	541	Electromagnetic Theory I	3
PHYS	542	Electromagnetic TheoryII	3
PHYS	550	Quantum Mechanics I	3
PHYS	551	Quantum Mechanics II	3
PHYS	565	Particle and Nuclear Physics	3
PHYS	571	Math Methods of Physics	3
PLSC	340	Nursery Management	3
PLSC	341	Nursery Management Lab	1
PLSC	451	Vegetable Crops	3
PLSC	490	Potato Science	3
PLSC	510	Invasive Plant Biology	3
PLSC	533	Plant Tissue Culture Technique	3
PLSC	546	Plant Breeding	3
PLSC	547	Biometrics/Plant Scientists	3
PLSC	590	Potato Science	1 to 3
PSYC	446	Engineering Psych	3
PSYC	516	Industrial/Organizational Psyc	3
PSYC	535	Personnel	3
PSYC	541	Human Relations in Workplace	3
PSYC	561	Human-Computer Interaction	3
PSYC	562	Advanced Human Factors	3
REM	472	Remote Sensing of Environ	4
REM	556	Foraging Ecology of Herbivores	2
RMAT	536	Biocomposites	3
RMAT	538	Lignocellulosic Biomass Chem	3
SOIL	415	Soil and Environmental Physics	3
SOIL	422	Environmental Soil Chem	3
SOIL	454	Pedology	3
SOIL	456	North Idaho Field Trip	1
SOIL	514	Environmental Geophysics	3
SOIL	537	Soil Biochemistry	3
STAT	422	Survey Sampling Methods	3
STAT	428	Geostatistics	3
STAT	431	Statistical Analysis	3
STAT	507	Experimental Design	3
STAT	514	Nonparametric Statistics	3
STAT	519	Multivariate Analysis	3
STAT	525	Master's Econometrics	3
STAT	550	Regression	3
STAT	555	Statistical Ecology	3
STAT	565	Computer Intensive Statistics	3
WLF	544	Large Mammal Ecology	3
WLF	545	Wildlife Habitat Ecol	2 to 3
WLF	555	Statistical Ecology	3
WLF	561	Landscape Genetics	2
WLF	562	Landscape Genetics Lab	1 to 2

Writing Proficiency Requirements

Writing Proficiency Requirements

WSU faculty, administration, and regents have identified writing proficiency as a priority at WSU. Accordingly, all students will satisfy specified requirements to meet WSU's writing proficiency standards for graduation. The requirements are outlined below:

1. The WSU Writing Experience

- a. All students must satisfy the University Common Requirements by passing 6 hours of written and oral communication courses, including at least 3 in written communication.
- b. Prior to enrollment in first-year writing courses, all students must participate in the WSU Writing Placement Refinement Process for the purpose of refining placement in appropriate writing and writing support courses. This process is mandatory. The Writing Placement Refinement Process is administered during the summer New Student Orientation, at the beginning of fall semester, and prior to spring registration. Placement Refinement results will fine tune students' placement into an appropriate first-year writing course(s). In some instances, students may be exempted from ENGLISH 101 on the basis of their performance in the Placement Refinement Process. For more information, contact the Writing Assessment Office in CUE 305, or call 509-335-7959 or visit us at <http://writingprogram.wsu.edu>.
- c. Honors College students need to work with the Honors College to determine placement into first-year composition courses. For more information, contact the Honors College 509-335-4505 or visit them at <http://honors.wsu.edu>.
- d. University Common Requirement (UCORE) courses require student writing of various kinds, both formal and informal, in order to provide adequate instruction in writing skills and to provide a wide range of student experiences in writing for many purposes and audiences.
- e. Transfer students who have completed an approved Associate of Arts (AA) or Associate of Science (AS) degree at a Washington or Oregon community college are considered to have fulfilled the lower-division University Common Requirements. These students will still be responsible for meeting the other requirements for graduation, including those in the college and major departments. The University Writing Portfolio and the upper-division capstone course are not lower-division requirements and therefore cannot be satisfied by the approved associate degrees.

2. The University Writing Portfolio—Writing Assessment at Mid-Career

Successful completion of the University Writing Portfolio is a requirement for graduation at WSU. Students must satisfy this requirement once they have earned 60 credit hours or junior standing. The Writing Portfolio is a mid-career assessment of student progress and a diagnostic about student readiness for upper division writing challenges. Accordingly, the Portfolio must be completed before a student enrolls in Writing in the Major [M] courses. To complete the University Writing Portfolio, students must submit three papers they have written as a result of previously assigned college course work and take a timed writing exam consisting of two writing exercises. Visit <http://writingportfolio.wsu.edu> for more information.

3. Writing in the Major [M]

Two courses identified as writing in the major [M] must be included in course work taken to meet departmental requirements. Consult the requirements in the department in which you intend to major. Students must complete the University Writing Portfolio before enrolling in an [M] course.

WSU Graduation Requirements



University Honors College students do not complete University Common Requirements. Contact the Honors College for additional information.

Students who have completed an approved transferable A.A. degree should check the Admissions section of the catalog for more information.

UNIVERSITY COMMON REQUIREMENTS (UCORE)

These graduation requirements were developed to help students achieve WSU's Learning Goals and Outcomes. Four broad categories are divided into ten requirements; only approved classes will fulfill them. Match courses in the WSU Catalog (<http://catalog.wsu.edu>) to requirements using the [bracketed notation] that appears in the list below. Of the 34 total credits, only three, three-credit courses may be taken within the major.

FIRST-YEAR EXPERIENCE: 3 semester credit hours

- Roots of Contemporary Issues [ROOT] (3 cr.)
course: History 105 semester/year F Sp Su _____

FOUNDATIONAL COMPETENCIES: 9 cr.

- Quantitative Reasoning [QUAN] (3 cr.)
course: _____ semester/year F Sp Su _____
- Written Communication [WRTG] (3 cr.)
course: _____ semester/year F Sp Su _____
- Communication [COMM] [WRTG] (3 cr.)
course: _____ semester/year F Sp Su _____

WAYS OF KNOWING: 16 cr.

- Inquiry in the Social Sciences [SSCI] (3 cr.)
course: _____ semester/year F Sp Su _____
- Inquiry in the Humanities [HUM] (3 cr.)
course: _____ semester/year F Sp Su _____
- Inquiry in the Creative and Professional Arts [ARTS] (3 cr.)
course: _____ semester/year F Sp Su _____
- Inquiry in the Natural Sciences [BSCI] [PSCI] [SCI] (7 cr.)*
course: _____(L) semester/year F Sp Su _____
course: _____ semester/year F Sp Su _____

*At least 7 credits: one biological science [BSCI] and one physical science [PSCI] and one lab; or take 8 credits of [SCI] designated courses.

INTEGRATIVE AND APPLIED LEARNING: 6 cr.

- Diversity [DIVR] (3 cr.)
course: _____ semester/year F Sp Su _____
- Integrative Capstone [CAPS] (3 cr.)
course: _____ semester/year F Sp Su _____

UNIVERSITY GRADUATION REQUIREMENTS

- 120 semester credits (or total credits for a specific degree program) of which 30 minimum of are from Washington State University.
- 40 Upper Division (300/400 level) semester credits
- 2.0 minimum cumulative grade point average
- Completion of Writing Proficiency and UCORE requirements and college requirements, if applicable (see below)
- Completion of requirements for major including a minimum 2.0 cumulative GPA in the major (see relevant catalog section)

WRITING PROFICIENCY REQUIREMENTS

Graduation requirements that all students must complete:

- University Writing Portfolio/Qualifying Exam (to be completed when a student reaches 60 semester credits).
- Writing in the Major [M] courses*
course: _____ semester/year F Sp Su _____
course: _____ semester/year F Sp Su _____

*For more information about these, refer to the WSU Writing Program (<http://writingprogram.wsu.edu>) or the WSU Catalog (<http://catalog.wsu.edu>).

COLLEGE OF ARTS AND SCIENCES ADDITIONAL REQUIREMENTS

All students, including community college transfer students with an approved transferable A.A. degree from Washington, Oregon, Idaho, California, Arizona, or Hawaii, or students pursuing a second bachelor's degree in the majors in this college, will be held to the following requirements:

- Foreign Language: Complete 2 years of high school or 1 year of collegiate-level foreign language study (must be the same language)
- Additional 3 semester credits of [SSCI], [HUM], or [ARTS]
- Additional 1 lab credit of [BSCI] or [PSCI] for a total of 8 semester credits (2 labs) or SCIENCE 101 [SCI] and 102 [SCI]



University Common Requirements

Washington State University's general education curriculum, called the **University Common Requirements** (UCORE), applies to all students who enter WSU fall 2013 and after. Continuing students must refer to the requirements detailed in prior catalogs under the General Education Requirement section. Honors students complete the Honors College version of the general education curriculum outlined in the Honors section of this catalog.

The University Common Requirements (UCORE) are the center of the undergraduate curriculum. While the greater part of students' courses of study will be devoted to their major fields, the UCORE curriculum provides a degree of balance between the specialized focus of the major and the broader traditional objectives of higher education. UCORE is intended to accommodate needs and objectives not adequately served by academic specialization, while being flexible enough to work for all majors. Accordingly, the program offers a wide variety of elective choices and provides many individual pathways through the curriculum.

Seven Goals of the Baccalaureate

All bachelor's degree requirements are rooted in the Seven Goals of the Baccalaureate described below. Courses in the UCORE curriculum engage students in meeting these goals.

CRITICAL AND CREATIVE THINKING

Graduates will use reason, evidence, and context to increase knowledge, to reason ethically, and to innovate in imaginative ways.

Graduates may demonstrate critical and creative thinking by their ability to:

1. Define, analyze, and solve problems.
2. Integrate and synthesize knowledge from multiple sources.
3. Assess the accuracy and validity of findings and conclusions.
4. Understand how one thinks, reasons, and makes value judgments, including ethical and aesthetic judgments.
5. Understand diverse viewpoints, including different philosophical and cultural perspectives.
6. Combine and synthesize existing ideas, images, or expertise in original ways.
7. Think, react, and work in an imaginative way characterized by a high degree of innovation, divergent thinking, and risk taking.

QUANTITATIVE REASONING

Graduates will solve quantitative problems from a wide variety of authentic contexts and everyday life situations.

Graduates may demonstrate quantitative and symbolic reasoning by their ability to:

1. Explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, and words).
2. Convert relevant information into various mathematical forms (e.g., equations, graphs, diagrams, tables, and words).
3. Understand and apply quantitative principles and methods in the solution of problems.
4. Make judgments and draw appropriate conclusions based on the quantitative analysis of data, while recognizing the limits of this analysis.
5. Identify and evaluate important assumptions in estimation, modeling, and data analysis.
6. Express quantitative evidence in support of the argument or purpose of work (in terms of what evidence is used and how it is formatted, presented, and contextualized).

SCIENTIFIC LITERACY

Graduates will have a basic understanding of major scientific concepts and processes required for personal decision-making, participation in civic affairs, economic productivity and global stewardship.

Graduates may demonstrate scientific literacy by their ability to:

1. Identify scientific issues underlying global, national, local and personal decisions and communicate positions that are scientifically and technologically informed.
2. Evaluate the quality of scientific and health-related information on the basis of its source and the methods used to generate it.
3. Pose and evaluate arguments based on evidence and apply conclusions from such arguments appropriately.
4. Recognize the societal benefits and risks associated with scientific and technological advances.

INFORMATION LITERACY

Graduates will effectively identify, locate, evaluate, use responsibly and share information for the problem at hand.

Graduates may demonstrate information literacy by their ability to:

1. Determine the extent and type of information needed.
2. Implement well-designed search strategies.
3. Access information effectively and efficiently from multiple sources.
4. Assess credibility and applicability of information sources.
5. Use information to accomplish a specific purpose.
6. Access and use information ethically and legally.

COMMUNICATION

Graduates will write, speak and listen to achieve intended meaning and understanding among all participants.

Graduates may demonstrate communication skills by the ability to:

1. Recognize how circumstances, background, values, interests and needs shape communication sent and received.
2. Tailor message to the audience.
3. Express concepts, propositions, and beliefs in coherent, concise and technically correct form.
4. Choose appropriate communication medium and technology.
5. Speak with comfort in front of groups.
6. Follow social norms for individual and small group interactions, which includes listening actively.

DIVERSITY

Graduates will understand, respect and interact constructively with others of similar and diverse cultures, values, and perspectives.

With regard to local and global diversity, graduates may demonstrate their ability to:

1. Critically assess their own core values, cultural assumptions and biases in relation to those held by other individuals, cultures, and societies.
2. Analyze and critique social, economic and political inequality on regional, national and global levels, including identifying one's own position within systems.
3. Recognize how events and patterns in the present and past structure and affect human societies and world ecologies.
4. Critically assess the cultural and social underpinnings of knowledge claims about individuals and groups, and their relations to one another.
5. Actively seek opportunities to learn from diverse perspectives and to combat inequalities.

DEPTH, BREADTH, AND INTEGRATION OF LEARNING

Graduates will develop depth, breadth, and integration of learning for the benefit of themselves, their communities, their employers, and for society at large.

Graduates may demonstrate depth, breadth, and integration of learning:

1. Through study in the sciences and mathematics, social sciences, humanities, histories, languages, and the arts.
2. By showing a depth of knowledge within the chosen academic field of study based on integration of its history, core methods, techniques, vocabulary, and unsolved problems.
3. By applying the concepts of the general and specialized studies to personal, academic, service learning, professional, and/or community activities.
4. By understanding how the methods and concepts of the chosen discipline relate to those of other disciplines and by possessing the ability to engage in cross-disciplinary activities.

The Structure of the UCORE Program

Students are required to take a minimum of 34 credit hours distributed among the categories listed below.

These graduation requirements were developed to help students achieve WSU's Learning Goals and Outcomes. Four broad categories are divided into ten requirements, which only approved classes will fulfill. Match courses in the WSU Catalog (catalog.wsu.edu) to requirements using the bracketed notation that appears in the list below.

FIRST-YEAR EXPERIENCE	Credits
Roots of Contemporary Issues - HISTORY 105 [ROOT] ¹	3
FOUNDATIONAL COMPETENCIES	
Quantitative Reasoning [QUAN]	3
Written Communication [WRTG]	3
Communication or Written Communication [COMM] [WRTG]	3
WAYS OF KNOWING	
Inquiry in the Social Sciences [SSCI]	3
Inquiry in the Humanities [HUM]	3
Inquiry in the Creative and Professional Arts [ARTS]	3
Inquiry in the Natural Sciences [BSCI] [PSCI] [SCI] ²	7 or 8
INTEGRATIVE AND APPLIED LEARNING	
Diversity [DIVER]	3
Integrative Capstone [CAPS]	3
Total Required Semester Credit Hours	34 or 35 cr.

¹ Transfer students with 45 credits or more but without a direct transfer AA degree (DTA) may substitute HISTORY 305 for this requirement.

² At least 3 credits in Biological Science [BSCI] and 3 credits in Physical Science [PSCI] plus 1 additional lab hour, or 8 credits of [SCI] designated courses.

General Rules

- No course designated as a University Common Requirement (UCORE) can be taken on a pass, fail basis. All UCORE-designated courses must be letter-graded (i.e., A, B, C, D, and F). The only exception possible is for CAPS courses, which may have S, F grading. However, such an exception is not automatic and must be justified when the course is submitted by the department for UCORE approval.
- A maximum of three (3 or 4 credit) UCORE courses may be taken within the major. For the purpose of this limitation, three 1-credit UCORE courses may be combined to count for a single 3-credit UCORE course.
- Quantitative Reasoning [QUAN]: This requirement can be satisfied by passing a designated course or courses in mathematics, through satisfactory performance on the Advanced Placement examination, or by passing a calculus course beyond Math 171.

Transfer Students: Two full years of credit and completion of lower-division University Common Requirements normally will be granted to students who have been awarded the Direct Transfer Associate (AA) degree from a Washington community college. The Associate of Arts—Oregon transfer degree from an Oregon community college guarantees completion of the lower-division University Common Requirements, but does not guarantee junior standing or 60 semester credits. Certain approved associate's degrees from Arizona, California, Hawaii, and Idaho may also be considered to have fulfilled the lower-division University Common Requirements for graduation, but do not guarantee junior status (60 semester credits). For details on specific degrees consult the Office of Admissions.

Transfer students will still be responsible for meeting the other requirements for graduation, including those in the college and major department. The University Writing Portfolio and the upper-division Integrated Capstone [CAPS] are not lower-division requirements and therefore cannot be satisfied by the approved AA or AS degrees. Please note that other kinds of degrees from community colleges, or degrees from states other than Washington and Oregon, do not automatically fulfill University Common Requirements.

UCORE Categories and Course Lists**FIRST-YEAR EXPERIENCE****Roots of Contemporary Issues [ROOT]**

Roots of Contemporary Issues is among the first courses students will take at WSU, providing a strong intellectual foundation for college learning upon which students can build for the rest of their careers. The ROOTS course introduces the university's undergraduate learning goals via the history of global issues that affect human life on the planet in the 21st century, such as environmental change, war, globalization, inequality, and cultural diversity. The course includes multiple cultural, political, and disciplinary perspectives so that students engage with the diversity of the human experience, across both time and space.

HISTORY 105	Roots of Contemporary Issues
HISTORY 305	Roots of Contemporary Issues for Transfer Students

FOUNDATIONAL COMPETENCIES**Quantitative Reasoning [QUAN]**

QUAN courses broaden students' understanding of and appreciation for mathematical reasoning while at the same time giving them a skill set that will be of value to everyday life. These courses advance the fundamentals of quantitative reasoning; develop skills for interpreting and evaluating quantitative representations (charts, graphs, algorithms, etc.); and promote identification of the strengths and weaknesses of quantitative methods for representing and solving problems.

CPT S 111	Introduction to Algorithmic Problem Solving
ECONS 335	Business Finance Economics
ENGR 107	Introductory Mathematics for Engineering Applications
FIN 223	Personal Finance
MATH 105	Exploring Mathematics
MATH 140	Mathematics for Life Scientists
MATH 171	Calculus I
MATH 202	Introduction to Mathematical Analysis
MATH 252	Fundamentals of Elementary Mathematics II
PHIL 201	Introduction to Formal Logic
PSYCH 311	Elementary Statistics in Psychology
STAT 205	Statistical Thinking
STAT 212	Introduction to Statistical Methods

Written Communication [WRTG]

WRTG courses require students to develop and express ideas clearly, concisely, and effectively in writing. Using strategic assignments and aligned evaluation criteria, WRTG courses develop a student's understanding of the principles

and elements of effective written communication through extensive applied practice, self-evaluation, and revision.

ENGLISH 101	College Composition
ENGLISH 105	College Composition for Multilingual Writers
ENGLISH 201	Writing and Research
ENGLISH 298	Writing and Research Honors
ENGLISH 301	Writing and Rhetorical Conventions
ENGLISH 402	Technical and Professional Writing
ENGLISH 403	Technical and Professional Writing ESL
PHIL 200	Critical Thinking and Writing

Communication [COMM] or Written Communication [WRTG]

COMM courses focus on non-written mediums, such as public speaking, conversational foreign language, interpersonal communication, visual literacy, multimedia authoring, and intercultural communication. These courses require students to develop and express ideas clearly, concisely, and effectively in media beyond purely written communication in ways that creatively adapt content and conventions to diverse contexts, audiences, and purposes. Development of communication abilities may involve working with a variety of technologies, such as mixing texts, data, and images. It also may involve oral presentations and discourse, such as public speaking, small-group interaction, one-on-one conversation, and active listening. All COMM courses develop a student's understanding of the principles and elements of effective communication through extensive applied practice, self-evaluation, and revision.

COM 102	Communication in an Information Society
COM 210	Multimedia Content Creation
COM 400	Communicating Science and Technology
ENGLISH 101	Introductory Writing
ENGLISH 105	Composition for ESL Students
ENGLISH 106	Communicating in Academic Contexts
ENGLISH 201	Writing and Research
ENGLISH 298	Writing and Research Honors
ENGLISH 301	Writing and Rhetorical Conventions
ENGLISH 402	Technical and Professional Writing
FRENCH 361	Advanced French for the Professions
GERMAN 361	German for the Professions
H D 205	Communication in Human Relations
MKTG 279	Professional Persuasive Communications
NEUROSCI/MBIOS 201	Introduction to Communication in the Molecular Life Sciences

WAYS OF KNOWING

Inquiry in the Social Sciences [SSCI]

SSCI courses teach students how social sciences apply empirical principles and methods to understand human beings as social agents in cultural, group, and individual contexts. They do so by familiarizing students with the methods of inquiry appropriate to the discipline as well as the key concepts and major paradigms in the social sciences. Students in SSCI courses learn to identify and understand relevant source material and to evaluate empirical research and conceptual theories, often by analyzing current issues through the lens of social science disciplines.

AFS 336	Agriculture, Environment, and Community
ANTH 130	Great Discoveries in Archaeology
ANTH/WOMEN ST 214	Gender and Culture in America
ANTH 302	Childhood and Culture
ANTH 309	Cultural Ecology
ANTH 331/CES 376	America before Columbus
CES 131	Introduction to Black Studies
CES 171	Introduction to Indigenous Studies
CES 244	Critical Globalizations
CES 254	Comparative Latino/a Cultures
CES 308	Cultural Politics of Sport
CES 335/HISTORY 313	Black Freedom Struggle
COM 101	Media and Society
CRM J 101	Introduction to the Administration of Criminal Justice
ECONS 101	Fundamentals of Microeconomics
ECONS 102	Fundamentals of Macroeconomics

HBM 235
H D 101
H D/WOMEN ST 204
H D 334
POL S 101
POL S 102
POL S 103
PSYCH 105
SOC 101
SOC 102
SOC 332

Travel, Society, and Business
Human Development Across the Lifespan
Family Interactions
Principles of Community Development
American National Government
Introduction to Comparative Politics
International Politics
Introductory Psychology
Introduction to Sociology
Social Problems
Society and Environment

Inquiry in the Humanities [HUM]

The humanities grapple with the human condition in all of its complexity through time and across cultures. The humanities include knowledge of American and world history, philosophical traditions, major religions, diverse cultural legacies, literature, film, and music. As fields of study, the humanities emphasize analysis, interpretation, and reflection. They also engage centrally with questions of meaning and purpose. Students in HUM courses are introduced to the basic theories of interpretation in the humanities as well as to key texts, monuments, artifacts, or episodes within humanistic traditions or disciplines. These courses help students develop the ability to construct their own artistic, literary, philosophical, religious, linguistic, or historical interpretations.

ANTH 201	Art and Society
CES 111	Introduction to Asian Pacific American Studies
CES 151	Introduction to Chicano/Latino Studies
CES 209	Hip Hop Around the Globe
CES/ENGLISH 220	Introduction to Multicultural Literature
CES/HISTORY/ WOMEN ST 235	African American History
CES 260	Race and Racism in US Popular Culture
CES 313/ENGLISH 311	Asian Pacific American Literature
COM 105	Communication in Global Contexts
ENGLISH 108	Introduction to Literature
ENGLISH 110	Reading Now
ENGLISH 205	Introduction to Shakespeare
ENGLISH 210	Readings in American Literature
ENGLISH 305	Shakespeare
ENGLISH 366	The British Novel to 1900
ENGLISH 368	The American Novel to 1900
ENGLISH 372	19th Century Literature of the British Empire and the Americas
FOR LANG 102	Humanities in the Ancient World
FOR LANG/ HUMANITY 130	Global Literature in Translation
FRENCH 110	French/Francophone Film
FRENCH 120	French Culture
FRENCH 320	French/Francophone Culture
GERMAN 120	Germanic Culture
GERMAN 320	German Culture
HISTORY 101	Classical and Christian Europe
HISTORY 102	Modern Europe
HISTORY 110	American History to 1877
HISTORY 111	American History Since 1877
HISTORY 121	World History II
HISTORY 230	Latin America, The Colonial Period
HISTORY 231	Latin America, The National Period
HISTORY 331	Latin American Cultural History
HISTORY 355	History of European Popular Culture
HISTORY/ASIA 373	Chinese Civilization
HISTORY/ASIA 374	Japanese Civilization
HISTORY 382	History of Science and Technology Since Newton
HISTORY 418	United States, 1914-1945
HISTORY 419	United States, 1945-Present
HISTORY 432	20th Century Latin America
HISTORY 440	The Early Middle Ages, 330-1050
HISTORY 450	Europe Since 1945
HUMANITY 101	Humanities in the Ancient World
HUMANITY 103	Mythology

HUMANITY/FOR LANG 302	Humanities in the Middle Ages and Renaissance
HUMANITY/FOR LANG 304	Humanities in the Modern World
JAPANESE/ASIA 123	Modern Japanese Culture
MUS 265/CES 271	Native Music of North America
MUS 359	History of Music: Antiquity to 1650
MUS 360	History of Music: 1650 - 1850
MUS 361	History of Music: 1850 - Present
PHIL 101	Introduction to Philosophy
PHIL 103	Introduction to Ethics
PHIL 207	Philosophy of Religion
PHIL 210	Philosophy in Film
PHIL 220	Philosophy of Food
PHIL/ASIA 280	Islam in Theory and Practice
PHIL/ASIA 314	Philosophies and Religions of India
PHIL/ASIA 315	Philosophies and Religions of China and Japan
PHIL 360	Business Ethics
PHIL 365	Biomedical Ethics
PHIL 370	Environmental Ethics
SPANISH 120	Peninsular Spanish Culture
SPANISH 121	Latin American Culture
WOMEN ST/ENGLISH 211	Diverse Sexualities and Cultural Production
WOMEN ST 338	Women and Popular Culture

Inquiry in the Creative and Professional Arts [ARTS]

Creative expression is a fundamental human activity that results in the production of objects, environments, and experiences that engage the senses, emotions, and/or intellect. The creative and professional arts offer direct participation in such activities while providing a framework for their interpretation, evaluation, and appreciation. In this category the domain of the arts is broadly defined to include not only the fine arts and performing arts, but also the professional arts, such as architecture, graphic design, and digital arts. Some ARTS courses ask students to perform, produce, fabricate or generate an aesthetic object, installation, presentation, composition, performance, or other creative work. Other ARTS courses ask students to critically analyze, interpret, or evaluate the creative activities or accomplishments of others, past or present. In both types of courses, students also demonstrate that their creative or interpretive analysis is grounded in existing historical, critical, or methodological scholarship.

AMDT 408	Visual Analysis and Aesthetics
ANTH 301	Arts and Media in Global Perspective
DTC 101	Introduction to Digital Technology and Culture
DTC 201	Tools and Methods for Digital Technology
ENGLISH 339	Topics in Film as Literature
ENGLISH 342	Documentary Film Theory and Production
FINE ART 101	Introduction to Art
FINE ART 102	Visual Concepts I
FINE ART 103	Visual Concepts II
FINE ART 201	World Art History I
FINE ART 202	World Art History II
FINE ART 303	Modern Art - 19th Century
FINE ART 305	Arts of Ancient Greece and Rome
FINE ART 307	The Arts of Renaissance Europe
FINE ART 340	Ceramics
FINE ART 350	Sculpture
MUS 120	Class Guitar
MUS 153	Musical Style in Composition
MUS 160	Survey of Music Literature
MUS 161	Introduction to Theatre
MUS 163	World Music
MUS 262	Rock Music: History and Social Analysis
MUS 266	Film Music
MUS 428	Opera Workshop
MUS 429	Tenor/Bass Choir
MUS 430	Treble Choir
MUS 431	Concert Choir
MUS 432	University Singers
MUS 433	Vocal Ensembles
MUS 434	Symphony Orchestra
MUS 436	Symphonic Band
MUS 437	Wind Symphony

MUS 438	Jazz-Lab Band
MUS 439	Vocal Jazz Ensemble
SDC 100	World of Design and Construction
SPANISH 110	Peninsular Spanish Film
SPANISH 111	Latin American Film
WOMEN ST 369/CES 309	Queer Identities in Contemporary Cultures

Inquiry in the Natural Sciences [BSCI] [PSCI] [SCI]

Science is an approach to asking and answering questions about the natural world. Scientific inquiry uses empirical observations to formulate logical conclusions supported by the evidence. Scientific inquiry also develops evidence-based arguments to advance knowledge within the scientific community. All courses in the natural sciences categories actively engage students in rigorous study of scientific problems. They emphasize science as a process and help students develop a knowledge-based framework by which to make judgements about current issues as scientifically informed citizens.

Courses that fulfill the lab requirement are marked with (L).

— Biological Sciences [BSCI]

ANIM SCI 205	Companion Animal Nutrition
ANTH 260	(L) Introduction to Biological Anthropology
ANTH 381	Primate Behavioral Ecology
BIOLOGY 101	Direction in Biological Sciences
BIOLOGY 102	(L) General Biology
BIOLOGY 103	(L) Science and Scientific Thinking
BIOLOGY 106	(L) Introductory Biology: Organismal Biology
BIOLOGY 107	(L) Introductory Biology: Cell Biology and Genetics
BIOLOGY 110	Scientific Perspective on Global Issues
BIOLOGY 111	(L) Laboratory Experiments in Biology and Genetics
BIOLOGY 120	(L) Introduction to Botany
BIOLOGY 125	Genetics and Society
BIOLOGY 135	Animal Natural History
BIOLOGY 140	Introduction to Nutritional Science
BIOLOGY 150	Evolution
BIOLOGY 298	(L) Honors Biology for Non-Science Majors
BIOLOGY 308	Marine Biology
BIOLOGY 333	Human Nutrition and Health
BIOLOGY/WOMEN ST 407	Biology of Women
ENTOM 101	Insects and People: A Perspective
ENTOM 102	(L) Insects, Infection and Illness: Medical Entomology for Non-Science Majors
ENTOM 103	(L) Discover Insects: A Laboratory Course for Non-Science Majors
ENTOM 150	(L) Insects, Science, and World Cultures
ENTOM 201	Science in the Public Eye
ENVR SCI 101	(L) Environment and Human Life
FS 201	Science on Your Plate
HORT 150	(L) Science and Art of Growing Plants
MBIOS 101	(L) Introductory Microbiology
MBIOS 320	DNA and Society
NEUROSCI 150	Art and the Brain
PL P 150	Molds, Mildews, Mushrooms: The Fifth Kingdom
PSYCH 372	Biological Basis of Behavior
SOIL SCI 201	Soil: A Living System

— Physical Sciences [PSCI]

ASTRONOM 135	(L) Astronomy
ASTRONOM 138	Planets and Planetary Systems
ASTRONOM 150	Science and the Universe
ASTRONOM 390	(L) The Night Sky
CHEM 101	(L) Introduction to Chemistry
CHEM 105	(L) Principles of Chemistry I
ENVR SCI 250	Introduction to Earth System Science
GEOLOGY 101	(L) Introduction to Geology
GEOLOGY 103	Other Worlds: Comparative Planetology of our Solar System

GEOLOGY 210	(L)Earth's History and Evolution
GEOLOGY 230	Introductory Oceanography
PHYSICS 101	(L) General Physics
PHYSICS 102	(L) General Physics
PHYSICS 150	Physics and Your World
PHYSICS 201	(L) Physics for Scientists and Engineers I
PHYSICS 202	(L) Physics for Scientists and Engineers II
PHYSICS 205	(L) Physics for Scientists and Engineers I - Honors
PHYSICS 206	(L) Physics for Scientists and Engineers II - Honors

— Sciences [SCI]

AMDT 210	(L) Textiles
SCIENCE 101	(L) Origins in the Natural World
SCIENCE 102	(L) Dynamic Systems in the Natural World

INTEGRATIVE AND APPLIED LEARNING

Diversity [DIVR]

Diversity courses introduce students to cultural differences and similarities by exploring the multiplicity of individual and group experiences in various historical periods, societies, and cultures. They also help students to ask complex questions about other cultural groups, cultures, and societies, and to seek out answers that reflect multiple cultural perspectives. Through this process, DIVR courses help students achieve an understanding of cultural/social positioning and cultural differences by way of theoretical and disciplinary scholarship, moving beyond their prior knowledge, individual experiences, and perception-based comparisons and analysis.

AMDT 417	Social and Psychological Aspects of Dress
ANTH 101	General Anthropology
ANTH 203	Peoples of the World
ANTH 307	Contemporary Cultures and Peoples of Africa
ANTH/WOMEN ST 316	Gender in Cross Cultural Perspective
ANTH 327/CES 378	Contemporary Native Peoples of the Americas
ANTH/FOR LANG 350	Speech, Thought, and Culture
ASIA 301	East Meets West
ASIA 322*	Ecology in East Asian Cultures
CES 101	Introduction to Comparative Ethnic Studies
CES 291	Anti-Semitism
CES 325	Traveling Cultures: Tourism in Global Perspective
CHINESE 111*	Asian Film
CHINESE 131*	Masterpieces of Asian Literature
COMSOC 321	Intercultural Communication
COUN PSY 457	Chicano/a Latino/a Psychology
CRM J 205	Realizing Justice in a Multicultural Society
ENGLISH 322/CES 332	Topics in African American Literature
ENGLISH 362	Rhetorics of Racism
ENGLISH 489	20th/21st Century British and Postcolonial Literatures
FOR LANG 101	Introduction to the World of Languages
FOR LANG 120	Introduction to Foreign Cultures
FOR LANG/ASIA 220	Global Issues, Regional Realities
H D 350	Family Diversity
HISTORY 120	World History I
HISTORY 130	History of Organized Crime in America
HISTORY 150	Peoples of the United States
HISTORY/ASIA 270	India: History and Culture
HISTORY/ASIA 271	Southeast Asian History: Vietnam to Indonesia
HISTORY/ASIA 272	Introduction to Middle Eastern History
HISTORY/ASIA 273	Foundations of Islamic Civilization
HISTORY 274	Introduction to African History
HISTORY/ASIA 275	Introduction to East Asian Culture
HISTORY/WOMEN ST 298	History of Women in American Society
HISTORY 308/CES 375	North American Indian History, Precontact to Present

HISTORY 314/CES 304	American Roots: Immigration, Migration, and Ethnic Identity
HISTORY 321	US Popular Culture, 1800 to 1930
HISTORY 322	US Popular Culture Since 1930
HISTORY/WOMEN ST 335	Women in Latin American History
HISTORY/WOMEN ST 398	History of Women in the American West
HISTORY/WOMEN ST 399	Lesbian and Gay History: Culture, Politics and Social Change in the US
HISTORY/ASIA 477	Modern Japanese History
JAPANESE 120*	Traditional Japanese Culture
JAPANESE 320*	Issues in East Asian Ethics
MUS 362	History of Jazz
MUS/WOMEN ST 363	Women in Music
NATRS 312	Natural Resources, Society, and the Environment
SOC 340	Social Inequality
SOC/WOMEN ST 351	The Family
SPANISH 321	Latin American Cultures
SPMGT 101	Sport and Popular Culture: Trends and Issues
WOMEN ST 101	Gender and Power: Introduction to Women's Studies
WOMEN ST/CES 120	Sex, Race, and Reproduction in Global Health Politics
WOMEN ST 220	Gender, Culture, and Science
WOMEN ST/CES/SOC 300	Intersections of Race, Class, Gender, and Sexuality
WOMEN ST/SOC 484	Lesbian and Gay Studies

*offered under several course subjects; see the catalog description for details.

Integrative Capstone [CAPS]

Integrative capstone courses bring opportunities for integration, application, and closure to the undergraduate experience, and prepare students for post-baccalaureate work and life-long learning. Occurring in the final year of a student's degree, the CAPS courses serve as a culminating experience for students to demonstrate achievement of the university's undergraduate learning goals. CAPS courses may occur within or outside the major, depending on the requirements of a student's major field of study. Many CAPS courses ask students to demonstrate a depth of knowledge within their chosen academic field of study that integrates its history, core methods, techniques, vocabulary, and unsolved problems. Other CAPS courses require students to apply concepts from their general and specialized studies to personal, academic, service learning, professional, and/or community activities. Other CAPS courses ask students to demonstrate how the methods and concepts of a chosen discipline relate to those of other disciplines through engaging in cross-disciplinary activities. Each type of CAPS course typically involves the production of a major project that demonstrates the student's cumulative learning toward the bachelor's degree.

AFS 401	Advanced Systems Analysis and Design in Agricultural and Food Systems
AMDT 413	Global Sourcing
ANIM SCI 464	Companion Animal Management
ANIM SCI 474	Beef Cattle Production
ANTH 404	The Self in Culture
ANTH 490	Integrative Themes in Anthropology
ARCH 403	Comprehensive Design Studio I
ASTRO 450	Life in the Universe
BIO ENG 411	Engineering Capstone Project II
BIOLOGY 401	Plants and People
BIOLOGY 408	Contemporary Genetics
BIOLOGY 483	Organisms and Global Change
BIOLOGY 485	Biology of the Oceans
CE 465	Integrated Civil Engineering Design
CES 405/ENGLISH 410	Cultural Criticism and Theory
CES 440	Global Social Justice
CES/WOMEN ST 489	Everyday Struggles for Justice and Equality
CHE 451	Chemical Process Analysis and Design II
CHEM 485	Senior Thesis in Chemistry
COM 471	Stereotypes in Communication
COMSOC 421	Intercultural Communication and Globalization
CPT S 423	Software Design Project II

CRM J/WOMEN ST 403	Violence Toward Women	SPANISH 420	Cultural Topics
CS 420	Software Engineering in Practice	TCH LRN 490	Advanced Practicum
E E 416	Electrical Engineering Design		
ECE 452	Capstone Design II		
ECONS 490	Economics Capstone		
ENGLISH 415	Traditions of Comedy and Tragedy		
ENGLISH 494	Advanced Topics in Literature		
ENGR 421	Multidisciplinary Engineering Design II		
ENGR 431	Interdisciplinary Design II		
ENTRP 492	Small Business Policy		
ENVR SCI 404	The Ecosystem		
FINE ART 408	Art History Thesis		
FINE ART 498	Contemporary Issues Seminar		
FOR LANG 410	Advanced Topics in Global Cinema		
FRENCH 410	French Film in Translation		
FRENCH 420	French Culture Through Wine		
FRENCH 430	Topics in French/Francophone Literature in Translation		
FS 489	Food Product Development		
GEOLOGY 408	Field Geology		
GERMAN 420	Socio-Cultural History of the German Language		
HBM 495	Case Studies and Research		
H D 403	Families and Poverty		
H D 415	Peak Experiences in Leadership		
HISTORY 409	American Environmental History		
HISTORY 417	Rise of Modern America		
HISTORY 435	European Expansion Overseas, 1400-1800		
HISTORY 436	Imperialism in the Modern World		
HISTORY 444	The Renaissance		
HISTORY/ASIA 474	Modern South Asia: Community and Conflict		
HISTORY 483	Medicine, Science, and Technology in World History		
HISTORY 492	Cultural Appetites: Food in World History		
HISTORY 495	Space, Place, and Power in History: Historical Geography in Global Perspective		
HORT 425	Trends in Horticulture		
I D 426	Interior Design Studio VII		
KINES 484	Exercise Prescription and Medical Conditions		
LND ARCH 485	Senior Comprehensive Project		
MATH 432	Mathematics for College and Secondary Teachers		
MATH 464	Linear Optimization		
MBIOS 494	Senior Project in Molecular Biosciences		
ME 416	Mechanical Systems Design		
MECH 417	Mechanical Systems Design II		
MGMT 491	Business Strategy and Policy		
MUS 461	The Musician in Society: Philosophies and Practices, 1850 - Present		
NATRS 454	Restoration Ecology		
NEUROSCI 490	Senior Project		
NURS 430	Senior Practicum		
NURS 495	Nursing Practice: Advanced Clinical Practicum		
PHIL 413	Mind of God and the Book of Nature: Science and Religion		
PHIL 442	Philosophy of Mind		
PHYSICS 408	Physics and Society		
POL S 428	Issues in Political Psychology		
POL S 430	The Politics of Natural Resource and Environmental Policy		
PSYCH 412	Psychological Testing and Measurement		
SHS 480	Senior Seminar		
SOC 415	Globalization		
SOC 495	Internship Capstone		
SOC 496	Capstone - From Theory to Practice: The Sociology of Service		
SOC 497	Capstone Research Practicum		

Departments, Requirements, and Courses

Department of Aerospace Studies

afrotc.wsu.edu
Kruegel 417
509-335-5598

*Colonel G. R. Downing; Captain D. K. Knutzen;
Captain R. Washburn.*

Air Force Reserve Officer Training Corps (AFROTC) AFROTC is a nationwide program that allows students to pursue commissions (become officers) in the United States Air Force (USAF) while simultaneously attending college. AFROTC classes are held on college campuses throughout the United States and Puerto Rico; students can register through normal course registration processes.

AFROTC consists of four years of Aerospace Studies classes (Foundations of the USAF, Evolution of USAF and Space Power, Air Force Leadership Studies, and National Security Affairs/Preparation for Active Duty), and a corresponding Leadership Laboratory for each year (where students apply leadership skills, demonstrate command and effective communication, develop physical fitness, and practice military customs and courtesies). College students enrolled in the AFROTC program (known as "cadets") who successfully complete both AFROTC training and college degree requirements will graduate and simultaneously commission as Second Lieutenants in the Active Duty Air Force.

The AFROTC program is currently offered at Washington State University, but they have a crosstown agreement that allows University of Idaho and Lewis-Clark State College students to enroll in AFROTC and become full-fledged cadet participants. For more information on AFROTC course descriptions, please review the Washington State University course catalog. For more information on the AFROTC program, please review afrotc.wsu.edu.

Minors

Aerospace Studies

A minor in aerospace studies requires at least 16 hours, 9 of which must be 300-400-level taken in residence at WSU or through WSU-approved education abroad or educational exchange courses, from: AERO 101, 102, 201, 202, 311, 312, 411, 412.

Description of Courses

AEROSPACE STUDIES

AERO

101 The Foundations of USAF I 1 Introduces students to the Air Force and AFROTC.

102 The Foundations of USAF II 1 Introduces students to the Air Force and AFROTC.

103 Leadership Laboratory I 2 (0-4) May be repeated for credit; cumulative maximum 4 hours. Leadership principles, military experience, and management practice; 2 hours laboratory and 2 hours required physical training. S, F grading.

201 The Evolution of USAF Air and Space Power I 1 Examines general aspects of air and space power through a historical perspective. Leadership Laboratory is mandatory for AFROTC.

202 The Evolution of USAF Air and Space Power II 1 Examines general aspects of air and space power through a historical perspective. Leadership Laboratory is mandatory for AFROTC.

203 Leadership Laboratory II 2 (0-4) May be repeated for credit; cumulative maximum 4 hours. Leadership principles, military experience, and management practice; 2 hours laboratory and 2 hours required physical training. S, F grading.

311 Air Force Leadership Studies I 3 Course Prerequisite: Concurrent enrollment in AERO 313 required. Examines general aspects of air and space power through a historical perspective.

312 Air Force Leadership Studies II 3 Course Prerequisite: Concurrent enrollment in AERO 313 required. Examines general aspects of air and space power through a historical perspective.

313 Leadership Laboratory III 2 (0-4) May be repeated for credit; cumulative maximum 4 hours. Leadership principles, military experience, and management practice; 2 hours laboratory and 2 hours required physical training. S, F grading.

411 National Security Affairs/Preparation for Active Duty I 3 Course Prerequisite: Concurrent enrollment in AERO 413 required. Examines general aspects of air and space power through a historical perspective.

412 National Security Affairs/Preparation for Active Duty II 3 Course Prerequisite: Concurrent enrollment in AERO 413 required. Examines general aspects of air and space power through a historical perspective.

413 Leadership Laboratory IV 2 (0-4) May be repeated for credit; cumulative maximum 4 hours. Introduces students to leadership principles, military experience, and management practice; 2 hours laboratory and 2 hours required physical training. S, F grading.

499 Special Problems V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.

Program in Aging

Johnson Tower 501
509-335-8439

Chair, D. Nelson.

The Program in Aging offers an interdisciplinary curriculum in gerontology, including courses in the social and health sciences, and offers a minor in aging. Students can choose to continue and earn a Certificate in Gerontology*. The program is designed to achieve the following objectives:

(1) To provide a body of knowledge which individuals may use in better understanding the processes and implications of aging in their own lives and for participation in community decision making regarding the scope, structure, and nature of programs for the elderly;

(2) To enhance the qualifications of students in the helping services, health sciences, communication, education, and business, who are planning careers which involve working with or providing services to older persons;

(3) To prepare students for graduate and professional training in gerontology; and

(4) To further university and societal goals of equity for persons of all ages.

*Contact the Department of Human Development, hd.pullman@wsu.edu.

Minors

Aging

The minor in aging requires a minimum of 18 hours of credit including BIOLOGY 140; H D 203 or 305; PSYCH 363 or 490; SOC 356, and approved aging-related courses (6 hours) to be selected from a list of recommended courses available from the program chair. Credit hours for the minor must include 9 hours of upper-division work taken in residence at WSU or through WSU-approved education abroad

or educational exchange courses. Students must obtain approval of their course selection from the program chair.

Certificates

Gerontology

The department of Human Development offers a Certificate in Gerontology. The certificate reflects a high standard of training and experience in the specific area of human development. Non-human development majors are required to complete any prerequisites for the internship requirement. The requirements include 6 hours in H D core courses that support the area of certification, 15 hours in required and optional courses, and 4 hours of internship that reflect the area of certification. Students must maintain an overall GPA of 2.5 in those courses that count toward the certificate.

Certificate requirements:

Required courses: BIOLOGY 140; H D 203 or 305; PSYCH 363 or 490; SOC 351 or 356. Elective Courses, 6 hrs minimum from the following: BIOLOGY 233; HBM 375, 497; H D 203, 305 (if not used in required), 360; KINES 264, 361; MGMT 101, 301; PHIL 103, 365; PSYCH 320, 363, 490 (if not used in required); SOC 250, 351, 356 (if not used in required); H D 497, H D 498.

Description of Courses

AGING

AGING

486 Special Topics in Aging: Study Abroad

V 1-15 May be repeated for credit; cumulative maximum 15 hours. S, F grading.

Program in Agricultural and Food Systems

afs.wsu.edu
Hulbert Hall 423
509-335-8406

Agricultural & Food Systems Program Director, D. Layne; Animal Sciences Department Chair and Professor, K. Johnson; Crop & Soil Sciences Department Chair and Professor, R. Koenig; School of Economic Sciences Director and Professor, A. Love; Plant Pathology Director and Professor, S. Hulbert; Horticulture Department Chair and Professor, B.W. Poovaiah; Entomology Department Chair and Professor, S. Sheppard; School of Food Science Director and Professor, B. Rasco; Teaching Faculty, J. Baser, M. Brady, I. Burke, C. Campbell, K. Campbell, L. Carpenter-Boggs, C. Carraway, A. Carter, D. Cobos, J. Cowan, D. Crowder, J. Davenport, J. Durfey, A. Felsot, M. Flury, L. Fox, J. Goldberger, J. Harsh, J. Holden, P. Jacoby, B. Jaeckel, K. Kidwell, M. Maquivar, V. McCracken, K. Murphy, M. Neff, J. Owen, W. Pan, H. Pappu, C. Peace, T. Peever, C. Perillo, M. Pumphrey, M. Quinn, N. Rayapati, J. Reganold, R. Rupp, K. Sanguinet.

Feed the world. Power the planet. Save the environment. It's a tall order by any measure, but especially when you consider that experts predict that by 2050, the world population will grow to more than 9 billion human beings. At the center of the issue is the agricultural enterprise of the 21st Century. WSU's Agricultural and Food Systems degree program focuses on vital aspects of agricultural and food systems ranging from plant and animal production to marketing and education. This innovative program provides students with what they need to build or work in a modern food system that is productive, competitive and sustainable.

Delivered collaboratively by departments within the College of Agricultural, Human, and Natural Resource Sciences, the AFS program provides foundational education in a wide array of disciplines, including crop and soil sciences, horticulture, entomology, plant pathology, and economics. Students can choose among five Bachelor of Science degree majors: Agricultural Education; Agricultural Technology and Production Management; Agricultural and Food Business Economics; Agricultural and Food Security; and Organic Agriculture Systems. The college offers a minor in Agricultural Systems, which is specifically designed to complement a major in Communications, for students interested in careers in the communications sector of the agricultural industry. The college also offers an interdisciplinary Master of Science in Agriculture degree, an undergraduate Certificate in Organic Agriculture, and a graduate Certificate in Sustainable Agriculture.

In order to certify in an AFS major, a student must have a minimum of 24 credits with a minimum cumulative GPA of 2.0. For complete information about all majors within the AFS degree programs, please see the AFS webpage at: <http://afs.wsu.edu>.

Bachelor of Science in Agricultural and Food Systems (Pullman campus)

Systems not silos. The AFS degree program emphasizes the highly integrated nature of the science disciplines involved in growing food. All students take a core set of courses designed to provide them with a broad interdisciplinary background as well as the decision making skills they'll need to succeed and excel in the workplace.

Capstone course. At the end of their program, all students take AFS 401, a capstone course designed specifically to provide a culminating experience to help in preparing students to be "job-ready, day one". Guest lectures from industry professionals challenge students on topics including developing your personal brand, project management, sales 101, private agricultural business ownership and succession planning, and the performance review process. A fundamental part of the capstone experience is a team-based, semester-long project where small groups of students each work on addressing an emerging issue or problem and providing recommendations to one of several industry partners (co-ops, private companies, etc.). Students meet regularly with industry partners (face-to-face, videoconference, phone) to define their project, collect research information and develop a project plan. They prepare meeting agendas, take minutes and report back to instructors to identify what worked, what did not work, and what changes they plan to make for the next meeting. Besides introducing students to their

business and colleagues, industry partners provide in-house research background information, assist in distributing employee surveys and provide excellent professional mentoring for students. At the end of the semester, student teams provide both a comprehensive written report and an oral presentation about their project and industry recommendations both to their peers and to industry leaders.

In addition to WSU's Six Learning Goals of the Baccalaureate, graduates with a major in AFS will be able to:

1. Identify and understand the interaction among key components that comprise agricultural and food systems across disciplines.
2. Obtain, evaluate, and apply scholarly information to expand understanding and knowledge-base of the systems.
3. Apply scientific and quantitative reasoning to address real world problems in agricultural and food systems.
4. Consider, evaluate, and integrate varying perspectives on issues related to agricultural and food systems.
5. Integrate ethical, economic, environmental, and cultural/societal contexts at the global and/or local level.
6. Communicate effectively to a broad range of audiences using appropriate traditional and emerging technological media.
7. Appreciate the breadth and depth of professional opportunities in agricultural and food systems.

The hands-on possibilities with the AFS degree are numerous. Students are encouraged to participate in undergraduate research projects, work as part-time employees with research and extension personnel, study abroad, and/or participate in professional internships to put their classroom training to work. Learn, lead, and connect through the Center for Transformational Learning and Leadership (<http://ctl.cahnrs.wsu.edu>). Student clubs also provide a variety of ways to interact with peers, faculty, and staff within the college, yet another way to enrich the educational experience (<http://cahnrs.wsu.edu/academics/Student-life/clubs/>).

Scholarships

Scholarships for AFS majors are available on a competitive basis, and are awarded based on ability, need, and interest in a career path in associated professions (<http://cahnrs.wsu.edu/academics/scholarships/>).

Transfer Students

Students planning to transfer into the AFS program should take courses that meet the University Common Requirements (UCORE) and the AFS core requirements when possible. Transfer articulation agreements have been developed with several Washington community colleges degree programs. More information can be found on our Transfer Student website: <http://cahnrs.wsu.edu/academics/transfer/>. Prospective transfer students are strongly encouraged to consult with an advisor within the AFS program for further guidance.

Graduate Studies

Master of Science in Agriculture (Pullman and Global Campus)

This advanced degree program focuses on the agricultural professional, practitioner, and educator

to meet the growing need for prepared individuals to apply new and emerging technologies and science to the advancement of agriculture. This degree offers professionals already working in the field the opportunity to continue their education while they continue employment either inside or outside of the Pullman area. Students may elect to customize their program or choose from three options: General Agriculture, Food Science and Management, or Plant Health Management (online only). Access complete program description on-line at: <http://msag.wsu.edu/>.

Master of Science and Doctor of Philosophy degrees are also offered in Crop Science, Economics, Entomology, Food Science, Horticulture, Plant Pathology, and Soil Science. More information can be found on the CAHNRS Graduate Studies website: <http://cahnrs.wsu.edu/academics/graduate-studies/>.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

AGRICULTURAL AND FOOD BUSINESS ECONOMICS (120 HOURS)

The Agricultural and Food Business Economics major gives students what they need to succeed in the food and agricultural business world – knowledge of business and economics practices as well as a deep understanding of animal, plant, and food systems. Graduates in this major are highly qualified to fill positions ranging from market researcher to product analyst to food broker in a variety of venues, including private industry, commercial farms and ranches, government agencies, production agriculture, and universities.

First Year

<i>First Term</i>	<i>Hours</i>
ANIM SCI 101	3
ECONS 101 [SSCI] or 102 [SSCI]	3
HISTORY 105 [ROOT]	3
HORT / CROP SCI 102	3
MATH 201 ¹	3

<i>Second Term</i>	<i>Hours</i>
[COMM] Course (COM 102 [COMM] or H D 205 [COMM] recommended)	3 or 4
ECONS 101 or 102	3
ENGLISH 101 [WRTG]	3
Humanities [HUM]	3
MATH 202 [QUAN] ¹	3

Second Year

<i>First Term</i>	<i>Hours</i>
AFS 101	3
CHEM 101 [PSCI] or 105 [PSCI]	4
Diversity [DIVR]	3
STAT 212 or MGTOP 215	4

<i>Second Term</i>	<i>Hours</i>
ACCTG 230	3
AFS 201	3
CHEM 102 or 106	4
Creative & Professional Arts [ARTS]	3

SOIL SCI 201 [BSCI]	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
AFS Core Systems Elective ²	3
BIOLOGY 120	4
ECONS 301	3
ECONS 350 ³	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 106	4
ECONS 302	3
ECONS 311 [M]	3
ECONS 335	3
Electives	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
300-400-level Electives	6
CROP SCI 360	3
ECONS 452 [M]	3

<i>Second Term</i>	<i>Hours</i>
300-400-level Electives	3
AFS 401 [CAPS]	3
ECONS 450 [M] or 453	3
ECONS 451	3
Electives	4

¹ An alternative to MATH 201 is MATH 106, 172, or 220. An alternative to MATH 202 is MATH 171.

² AFS Core Systems Electives: AGTM 310, ANIM SCI 464 [M], 472 [M], 474 [M], BIOLOGY 372 [M], CROP SCI 302, ECONS 351, HORT 320, NATRS 300, SOIL SCI 368, or other systems courses approved by your advisor.

³ ECONS 352, which is only offered in the spring, may be used as an alternative for ECONS 350.

AGRICULTURAL EDUCATION (129 HOURS)

Combining the best of both agriculture and teaching, the Agricultural Education major prepares students to educate the next generation of agricultural leaders and consumers. Highly sought after by employers, they teach high school and middle school agricultural science classes, as well as serve as FFA advisors, adult education instructors, community outreach coordinators, university extension agents, etc.

This major requires students to complete the AFS core courses and agricultural education required courses, as well as a series of teaching and learning courses to meet initial teacher certification requirements. Students also spend a semester student teaching in an agricultural education program in a Washington high school.

First Year

<i>First Term</i>	<i>Hours</i>
ANIM SCI 101	3
CHEM 101 [PSCI] or 105 [PSCI]	4
ECONS 101 [SSCI]	3
ENGLISH 101 [WRTG]	3
HORT / CROP SCI 102	3

<i>Second Term</i>	<i>Hours</i>
AGTM 201	3
CHEM 102 or 106	4
ENGLISH 201 [WRTG], 301 [WRTG] or 302 [M] ¹	3
HISTORY 105 [ROOT]	3
STAT 212 [QUAN], MATH 140 [QUAN], 171 [QUAN], or 202 [QUAN]	3 or 4
Complete West B Exam	

Second Year

<i>First Term</i>	<i>Hours</i>
300-400-level Ag Elective ²	3
AFS 101	3
BIOLOGY 120 [BSCI]	4
Creative & Professional Arts [ARTS]	3
TCH LRN 301	3
Certify in College of Education	

<i>Second Term</i>	<i>Hours</i>
AFS 201	3
BIOLOGY 106 or 107	4
Diversity [DIVR]	3
Humanities [HUM]	3
SOIL SCI 201	3
Complete Writing Portfolio	

<i>Third Term</i>	<i>Hours</i>
TCH LRN 317 (Available summer only)	2

Third Year

<i>First Term</i>	<i>Hours</i>
300-400-level Ag Elective ²	3
CROP SCI 360	3
ECONS 350 ³	3
TCH LRN 464	3
TCH LRN 465	3
TCH LRN 466	2

<i>Second Term</i>	<i>Hours</i>
AFS 401 [CAPS]	3
AGTM 402	3
ED PSYCH 468	3
TCH LRN 467 [M]	3
TCH LRN 469	2
TCH LRN 470	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
300-400-level Ag Elective ²	3
AFS Core Systems Elective ⁴	3
AG ED 440 [M]	2
AG ED 450	3
AG ED 471	2

<i>Second Term</i>	<i>Hours</i>
AG ED 407	8
TCH LRN 415	8

¹ One from ENGLISH 201, 301, 302 [M] or 402 is required for admission to the Teacher Education Program. Students who take ENGLISH 302 will need to take an additional [WRTG] or [COMM] course.

² The Agricultural upper-division electives are required for teacher certification in Agricultural Education. Any 300-400-level course with one of the following CAHNRS subjects: AGTM, AFS, ANIM SCI, CROP SCI, ECONS, ENTOM, ENIVR SCI, FS, HORT, IPM, LND ARCH, NATRS, PL P, SOIL SCI, or VIT ENOL not used to satisfy major requirements can be accepted to fulfill this requirement.

³ ECONS 352, which is only offered in the spring, may be used as an alternative for ECONS 350.

⁴ AFS Core Systems Electives: AGTM 310, ANIM SCI 464 [M], 472 [M], 474 [M], BIOLOGY 372 [M], CROP SCI 302, ECONS 351, HORT 320, NATRS 300, SOIL SCI 368, or other systems courses approved by your advisor.

AGRICULTURAL TECHNOLOGY AND PRODUCTION MANAGEMENT (120 HOURS)

Students in this hands-on major gain a science-based overview of agriculture and food systems, with an emphasis on the practical application of technology to agricultural production systems. The program combines students' inherent creativity and interest in physical and biological sciences, technology, mathematics, business, and related subjects with their desire to develop innovative solutions to a variety of agricultural problems.

Areas of application include precision agricultural operations and services, management of agricultural businesses, production operations, sales, and promotional work in domestic and international agricultural communities. Graduates are prepared to own, operate, and manage their own enterprises or to provide services for private or governmental entities.

First Year

<i>First Term</i>	<i>Hours</i>
ANIM SCI 101	3
CHEM 101 [PSCI] or 105 [PSCI]	4
HISTORY 105 [ROOT]	3
HORT / CROP SCI 102	3
Electives	2

<i>Second Term</i>	<i>Hours</i>
CHEM 102 or 106	4
ECONS 101 [SSCI]	3
ENGLISH 101 [WRTG]	3
SOIL SCI 201 [BSCI]	3
STAT 212 [QUAN]	4

Second Year

<i>First Term</i>	<i>Hours</i>
AFS 101	3
AGTM 305	3
AGTM 314	3
BIOLOGY 120	4
Humanities [HUM]	3

<i>Second Term</i>	<i>Hours</i>
[COMM] Course (COM 102 [COMM] or H D 205 [COMM] recommended)	3 or 4
ACCTG 230	3
AFS 201	3
BIOLOGY 106 or 107	4
Creative & Professional Arts [ARTS]	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
AFS 336 ¹	3
AGTM 315	3
CROP SCI 305, 403, ENTOM 343, or PL P 429 ²	3
CROP SCI 360	3
ECONS 350 ³	3

<i>Second Term</i>	<i>Hours</i>
AGTM 330	3
AGTM 412	3
Diversity [DIVR]	3
ECONS 450 [M] or [M] Elective ⁴	3
MGMT 301 or Elective ⁴	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
400-level Business or Elective ⁴	3
AFS Core Systems Elective ⁵	3
AGTM 451	1
MKTG 360 or Elective ⁴	3
Electives	2

<i>Second Term</i>	<i>Hours</i>
AFS 401 [CAPS]	3
AGTM 405	2
AGTM 416	3
ENGLISH 402 [M]	3
Electives	3

¹ NATRS 312 can be taken in the spring as an alternative to AFS 336.

² ENTOM 351 can be taken in the spring as an alternative to the other courses listed.

³ ECONS 352, which is only offered in the spring, may be used as an alternative for ECONS 350.

⁴ Completion of a Business minor is recommended. Working with their advisors, students are encouraged to apply electives towards a minor of their choice.

⁵ AFS Core Systems Electives: AGTM 310, ANIM SCI 464 [M], 472 [M], 474 [M], BIOLOGY 372 [M], CROP SCI 302, ECONS 351, HORT 320, NATRS 300, SOIL SCI 368, or other systems courses approved by your advisor.

AGRICULTURE AND FOOD SECURITY (120 HOURS)

Students in this major are the protectors of the world's plant-based food supply. The Agriculture and Food Security major prepares students to manage plant pests and diseases from a holistic perspective.

Students learn to understand the complexity of relationships within agricultural ecosystems, how external factors influence these systems, and how to effectively manage pests and diseases without incurring undue risks to human or environmental health. Course offerings begin with a strong scientific base in biology and chemistry, and expand to focus on crop science, soil science, integrated pest management, and plant pathology.

The major is an exciting blend of classroom instruction and field experience that is tailored to the eventual employment goals of the student. Graduates who can evaluate and diagnose pest and plant disease problems and recommend economically and ecologically sound ways to correct them are in great demand. Excellent employment opportunities exist with state, federal, and international agricultural, environmental, and regulatory agencies, agrichemical companies, agricultural and environmental consulting firms, food processing, forest product, and vegetable and seed companies, and a wide range of other agribusiness enterprises.

First Year

<i>First Term</i>	<i>Hours</i>
ANIM SCI 101	3
CHEM 101 [PSCI] or 105 [PSCI]	4
ECONS 101 [SSCI]	3
HISTORY 105 [ROOT]	3
HORT / CROP SCI 102	3

<i>Second Term</i>	<i>Hours</i>
[COMM] Course (COM 102 [COMM] or H D 205 [COMM] recommended)	3 or 4
CHEM 102 or 106	4
ENGLISH 101 [WRTG]	3
HORT / CROP SCI 202	4

Second Year

<i>First Term</i>	<i>Hours</i>
AFS 101	3
BIOLOGY 107 [BSCI] or 120 [BSCI]	4
Diversity [DIVR]	3
Humanities [HUM]	3
SOIL SCI 201	3

<i>Second Term</i>	<i>Hours</i>
AFS 201	3
BIOLOGY 106	4
Creative & Professional Arts [ARTS]	3
ENTOM 351	3
STAT 212 [QUAN]	4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
CROP SCI 305	3
CROP SCI 360	3
ECONS 350 ¹	3
ENTOM 343 [M]	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
AFS Core Systems Elective ²	3
IPM 452	3
SOIL SCI/AFS 302 [M] ³	3
Electives	6

Fourth Year

<i>First Term</i>	<i>Hours</i>
AFS 336	3
CROP SCI 403	3
PL P 300	2
PL P 429	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
400-500-level Seminar in CAHNRS ⁴	1
AFS 401 [CAPS]	3
SOIL SCI 441	3
Electives	6

¹ ECONS 352, which is only offered in the spring, may be used as an alternative for ECONS 350.

² AFS Core Systems Electives: AGTM 310, ANIM SCI 464 [M], 472 [M], 474 [M], BIOLOGY 372 [M], CROP SCI 302, ECONS 351, HORT 320, NATRS 300, SOIL SCI 368, or other systems courses approved by your advisor.

³ SOIL SCI 414 and 415 can be taken as an alternative to SOIL SCI 302 [M]. However another [M] course will be required.

⁴ 400-500-level Seminar: AGTM 451, CROP SCI/ SOIL SCI 412, HORT/VIT ENOL 409, or as approved by advisor.

ORGANIC AGRICULTURE SYSTEMS (120 HOURS)

Significantly different than conventional agriculture, organic food production is one of the fastest growing segments of agriculture, with retail sales increasing by 20 percent annually since 1991. In many ways, Washington State has been a leader in this burgeoning new industry. This revolutionary new major is the first of its kind to be offered in the United States. Students in this major take a diverse array of courses in the natural, environmental, economic, and social sciences, as well as a number of courses focused on organic production practices.

Students wanting a hands-on degree experience thrive in the organic major. WSU has over a four-acre certified organic teaching farm where students learn to produce certified organic vegetables, fruit, herbs, and flowers that they distribute through local food banks, on-campus food service, a 100-member CSA (community supported agriculture), and a local farmers' market. Students have the opportunity to tailor their program of study to specific areas of emphasis, such as organic animal and dairy production, economics and marketing, crop production, food science, pest management, soil management, etc. in consultation with their advisor.

The Organic Agriculture Program at WSU prepares students to work on or develop their own organic farm. It also prepares students for employment opportunities with nonprofit organizations and government agencies involved in environmental and food safety, as well as private-sector food processing, marketing, organic certification, and product development industries.

First Year

<i>First Term</i>	<i>Hours</i>
ANIM SCI 101	3
CHEM 101 [PSCI] or 105 [PSCI]	4
ECONS 101 [SSCI]	3
ENGLISH 101 [WRTG]	3
HORT / CROP SCI 102	3

<i>Second Term</i>	<i>Hours</i>
CHEM 102 or 106	4
HISTORY 105 [ROOT]	3
HORT / CROP SCI 202	4
SOIL SCI 101	3

Second Year

<i>First Term</i>	<i>Hours</i>
AFS 101	3
BIOLOGY 107 [BSCI] or 120 [BSCI]	4
Humanities [HUM]	3
STAT 212 [QUAN]	4

<i>Second Term</i>	<i>Hours</i>
[COMM] Course (COM 102 [COMM] or H D 205 [COMM] recommended)	3 or 4
AFS 201	3
BIOLOGY 106	4
Creative & Professional Arts [ARTS]	3
SOIL SCI 201	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 140	3
CROP SCI 305 or PL P 429	3
CROP SCI 360	3
ENTOM 343 [M]	3
Horticulture Production Elective ¹	3

<i>Second Term</i>	<i>Hours</i>
AFS 445	3
ECONS 352 ²	3
ENTOM 351	3
SOIL SCI 302 [M] ³	3
SOIL SCI 498	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
AFS 336	3
AFS Core Systems Elective ⁴	3
CROP SCI 403	3
Diversity [DIVR]	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
AFS 401 [CAPS]	3
CROP SCI / SOIL SCI 412	1
SOIL SCI 441	3
SOIL SCI 480	6
Electives	2

¹ Horticulture Production Electives: HORT 310, HORT 313, HORT 357 (spring), or as approved by advisor.

² ECONS 350, which is only offered in the fall, may be used as an alternative for ECONS 352.

³ SOIL SCI 414 and 415 can be taken as an alternative to SOIL SCI 302 [M]. However another [M] course will be required.

⁴ AFS Core Systems Electives: AGTM 310, ANIM SCI 464 [M], 472 [M], 474 [M], BIOLOGY 372 [M], CROP SCI 302, ECONS 351, HORT 320, NATRS 300, SOIL SCI 368, or other systems courses approved by your advisor.

Minors

Agricultural Systems

The minor in Agricultural Systems requires a minimum of 18 hours, 9 of which must be upper-division and taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. The requirements are 6 hours from ANIM SCI 101, AFS 101, CROP SCI/HORT 102, and SOIL SCI 101; 3 hours from CrROP SCI/HORT 202, ECONS 101 and SOIL SCI 201; and 3 hours each from three of four areas: Biotic Influences on Crop Production, Economic Aspects of Agricultural Systems, Sustainability, and Production. See department for an approved list of courses.

Certificates

Organic Agriculture (Online and in Pullman)

The Certificate in Organic Agriculture is an 18-credit undergraduate program that can be taken

along with a major in another field, or as a stand-alone educational experience. The certificate is ideal for professionals working in agriculture or related fields who require in-depth knowledge of organic systems, those wanting to pursue a career in organic agriculture, anyone interested in beginning a community-supported agriculture (CSA) enterprise, home gardeners, as well as current WSU students in other majors at WSU with an interest in organic agriculture. Students develop knowledge and skills that are applicable to industries and agencies involved in the food chain-from production, processing, and delivery to policy, regulation, and education.

The 18-credit certificate program is designed with 3 core courses (9 credit hours) required for all students, 3 credit hours of "experiential learning", plus a minimum of 6 additional credit hours (electives) selected from a range of courses. All courses already exist as permanent courses, and the certificate can be fulfilled through on-line delivery or in-class participation on the Pullman campus.

Requirements: Core: 9 credit hours from SOIL SCI 101, 201, and 302 (cross-listed as AFS 302); Experiential Learning: 3 credit hours from SOIL SCI 480 (for on-campus students) or 498 (for online students); Electives: 6 credit hours from AFS 445, BIOLOGY 140, CROP SCI 102, 360, 443, CRS 336, ECONS 101, 102, or SOIL SCI 441.

Sustainable Agriculture

The Graduate Certificate in Sustainable Agriculture provides post-baccalaureate students with an interdisciplinary understanding of practices and current issues in sustainable agriculture, along with the science that makes it work. Students who earn the Graduate Certificate in Sustainable Agriculture may take these skills into all industries and agencies involved in the food chain; from production, processing, and delivery to policy, regulation, and education. Students in any WSU graduate degree program are eligible for the certificate if they meet the prerequisites of the courses needed for the certificate. Students pursuing a graduate certificate may only accumulate 6 credits toward a master's degree and 9 credits towards a Ph.D. degree.

Students not in degree programs are also eligible to earn the certificate by enrolling as non-degree students, again providing that they meet the prerequisites of the courses needed for the certificate. Apply for admission to an academic department, indicating your intention to be classified as a part-time, certificate graduate student.

Description of Courses

AGRICULTURAL AND FOOD SYSTEMS

AFS

101 Introduction to Agricultural and Food Systems 3 Course Prerequisite: ANIM SCI 101 or concurrent enrollment; HORT 102 or concurrent enrollment. Introduction to the disciplines and integration of the fields of agriculture, food production, manufacturing and distribution to define and solve real-world problems.

- 201 Systems Skills Development for Agricultural & Food Systems** 3 Course Prerequisite: AFS 101; ANIM SCI 101; CROP SCI 102; ECONS 101. Development of tools and skills in building, evaluating and applying model systems in agricultural production, food manufacturing and distribution in rural society and society as a whole; focus on the types of systems, construction and analysis.
- 250 Civic Engagement in Sustainable Food Systems** 2 Introduction to sustainable food systems through lecture, discussion, and engagement. Spring Break field trip required.
- 302 [M] Introduction to Agroecology** 3 Agroecological crop production through case study analyses and applications of ecological principles in traditional and modern farming systems. (Crosslisted course offered as SOIL SCI 302, AFS 302). Recommended preparation: SOIL SCI 201.
- 336 [SSCI] Agriculture, Environment, and Community** 3 Course Prerequisite: 3 credits [SSCI] UCORE; sophomore standing. Sociological perspectives on major agrifood trends, alternative agrifood movements, and impacts on human communities and the natural environment.
- 350 Food Systems in Western Washington** 3 Course Prerequisite: CROP SCI/HORT 102; ECONS 101; SOIL SCI 201. Introduction to local and regional food systems unique to western Washington with an emphasis on the farm-to-table processes of foods and beverages. (Course offered as HORT 350, AFS 350).
- 401 [CAPS] Advanced Systems Analysis and Design in Agricultural and Food Systems** 3 Course Prerequisite: AFS 201; STAT 212 or 412; junior standing. Problem solving methodologies as applied to integrated agricultural systems analysis and design problems; strong emphasis on teamwork.
- 445 Field Analysis of Sustainable Food Systems** 3 Experiential course visiting farms, food processing and marketing facilities to develop understanding of issues and relationships of sustainable food systems. (Crosslisted course offered as AFS 445, CRS 445).
- 501 Current Research in Organic and Sustainable Agriculture** 3 Multidisciplinary framework to assess the sustainability of a range of farming and food systems.
- 545 Field Analysis of Sustainable Food Systems** 3 Experiential course visiting farms, food processing and marketing facilities to develop understanding of issues and relationships of sustainable food systems. (Crosslisted course offered as AFS 445, CRS 445).
- 590 Sociology of Agriculture and Food Systems** 3 Theories, concepts, debates, and methods associated with the sociology of agriculture and food systems.

AGRICULTURAL EDUCATION

AG ED

- 110 Introduction to Agricultural Education** 2 Introduction to Agricultural Education Model, requirements for becoming an agricultural teacher; roles of the agricultural teacher.
- 342 Methods of Teaching Agriculture** 3 Course Prerequisite: TCH LRN 303; admitted to teacher education (Secondary Education). Methods and strategies for teaching agricultural science.
- 407 Student Teaching in Agricultural Education** V 4-16 Course Prerequisite: AG ED 450; AG ED 442; AG ED 471. Supervised teaching in public schools including seminars reflecting effective teaching. Required preparation: Includes applying; paying certification fees; completing all other coursework for degree and teacher certification; receiving fingerprint clearance from WSP, FBI, and Office of Professional Practices; maintaining 2.5 GPA overall and in endorsement and professional core classes. Placement by interview only. S, F grading.
- 430 Reinforcing Core Academics in Agricultural Education** 4 (3-3) Strategies of reinforcing core academics in secondary agricultural education. This course leads to CASE certification.
- 440 [M] Principles of Career and Technical Education** V 2-3 Course Prerequisite: TCH LRN 464 or concurrent enrollment; TCH LRN 465 or concurrent enrollment; TCH LRN 466 or concurrent enrollment. Local, state, and national vocational technical educational legislation, policies, programs, and organizations.
- 442 Program Planning in Agricultural Education** 2 Organization and management of a total vocational agricultural program.
- 450 Planning, Curriculum, and Techniques in Ag Ed** 3 Course Prerequisite: TCH LRN 301; TCH LRN 317; admitted to teacher education (Secondary Education). Focus on career and technical education program planning, curriculum development, and instructional techniques for agricultural education programs.
- 471 Student Organizations in Agricultural Education** 2 Course Prerequisite: Concurrent enrollment AG ED 450. Role of Future Farmers of America (FFA) in student organizations; role of advisor; principles of leadership; characteristics of successful FFA chapters. Course equivalent to OSU's Ag 421/521.
- 497 Internship in Agricultural Education** V 2-12 May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: By interview only. Off-campus professional experience. S, F grading.

499 Special Problems V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.

504 Special Topics in Vocational Education V 1-3 Special topics in agricultural education or agriculture that will provide advanced training for teachers of agriculture.

508 Foundations of Vocational Education 3 Historical, philosophical, social, political and economic factors that influence education in vocational environments.

511 Seminar in Career and Technical Education V 1-2 Seminar addressing new and emerging legislation and educational programs in vocational education.

GENERAL AGRICULTURE

AGRI

501 Agriculture Master's Practicum V 2-3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Admission to graduate program in Masters of Science in Agriculture. Course individually designed to provide practical participation/experience under professional supervision in areas related to student's specialization.

502 Graduate Seminar 3 Presentations and discussions of contemporary issues, trends, and recent research and development by graduate students, faculty, and visiting scholars.

560 Contemporary Issues in Agricultural Technology and Policy 3 Contemporary issues in agricultural technology and policy implications.

562 Advanced Topics V 1-3 May be repeated for credit; cumulative maximum 4 hours. Directed group study of selected advanced topics in agriculture and related areas.

587 Research and Extension in Agriculture 3 Ways to effectively communicate research and extension information to diverse audiences; and to plan and assess effective extension programs.

700 Master's Research, Thesis, and/or Examination V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

702 Master's Special Problems, Directed Study, and/or Examination V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

AGRICULTURAL TECHNOLOGY AND MANAGEMENT

AGTM

201 Metal Fabrication 3 (1-6) Credit not granted for students who have already completed AGTM/ENGR 202, 203, or 204. Theory, applications, and practices of welding, machining, and associated techniques in fabricating with metals. (Crosslisted course offered as AGTM 201, ENGR 201).

202 Welding 1 (1-3) Credit not granted for students who have already completed AGTM/ENGR 201. Theory application and practices of welding and associated techniques in fabricating with metals. One of 3 two-week sessions of Metal Fabrication. Each session includes 3 hours lecture and 12 hours lab per week. (Crosslisted course offered as AGTM 202, ENGR 202).

203 Machining 1 (1-3) Credit not granted for students who have already completed AGTM/ENGR 201. Theory application and practices of machining and associated techniques in fabricating with metals. One of 3 two-week sessions of Metal Fabrication. Each session includes 3 hours lecture and 12 hours lab per week. (Crosslisted course offered as AGTM 203, ENGR 203).

204 Metal Fabrication 1 (1-3) Credit not granted for students who have already completed AGTM/ENGR 201. Theory application and practices of cutting and associated techniques in fabricating with metals. One of 3 two-week sessions of Metal Fabrication. Each session includes 3 hours lecture and 12 hours lab per week. (Crosslisted course offered as AGTM 204, ENGR 204).

305 Agricultural Precision Systems 3 (2-3) Systems for precision agriculture, equipment, software uses, principles, construction, care, tillage, planting, spraying, harvesting, and materials handling machinery. Field trips required. Cooperative: Open to UI degree-seeking students.

310 Small Engine Maintenance and Repair 3 (2-3) Safety, operation, maintenance, and troubleshooting engines; understanding of engine systems and components including compression, carburetion, cooling, fuel, and lubrication.

314 Agricultural Power Units and Mobile Electrical Systems 3 (2-3) Principles of thermodynamics, engine cycles, transmissions, electrical, starting, braking, steering, suspension systems, differentials and hydraulic systems.

315 Irrigation Systems and Water Management 3 (2-3) Principles of irrigation and drainage, water measurement, irrigation methods and practices, selection of irrigation system components. Cooperative: Open to UI degree-seeking students.

330 Electrical Power Systems for Agriculture 3 (2-3) Course Prerequisite: Sophomore standing. Methods of selecting and installing electrical power circuits in agricultural operations; light frame construction; motor and control circuits; Programmable Logic Controllers (PLCs).

402 Methods, Materials, and Machines for Teaching Ag Mechanics 3 Course Prerequisite: AGTM 201. Development of shop programs in project planning, demonstrations, and skills performance; safety and management of materials, tools, and machines.

405 Advanced Agricultural Precision Systems 2 (1-3) Course Prerequisite: AGTM 305. Advanced principles of precision agricultural systems, software uses, management of controllers on equipment, geographical information systems and global positioning systems.

412 Human and Machinery Risk Management 3 Course Prerequisite: Junior standing. History and current status of farm worker injury prevention programs in the US including worker's compensation insurance.

416 Fluid Power Systems 3 (2-3) Fluid power principles applied to the selection, design, operation, and management of agricultural and industrial machinery. Field trips required.

444 Teaching Practicum 1 May be repeated for credit; cumulative maximum 3 hours. Course Prerequisite: By instructor permission. Laboratory and research techniques for AgTM.

451 Seminar 1 May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: Junior standing. Readings and interviews, research, and oral presentation of professional subjects.

481 Independent Research V 1-4 May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: By instructor permission.

495 Internship in Agricultural Technology and Management V 2-3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: sophomore standing; prior approval of internship coordinator and advisor required. Work experience related to academic learning. S, F grading.

499 Special Problems V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.

Department of Animal Sciences

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Professor and Interim Chair, K. A. Johnson; Professors, M. E. Benson, J. R. Busboom, M. Du, L. K. Fox, J. H. Harrison, Z. Jiang, B. D. Rodgers; Associate Professors, H. L. Neibergs, M. L. Nelson, J. K. Pru; Assistant Professor, A. L. Adams Progar; Clinical Assistant Professor, M. G. Maquivar; Instructor, E. Clancey;

Adjunct & Affiliate Faculty, S. R. Kerr, P. S. Kuber, D. A. Llewellyn, S. M. Smith; Faculty Emeriti, M. V. Dodson, C. T. Gaskins, R. L. Kincaid, J. P. McNamara, D. D. Nelson, J. J. Reeves, R. W. Wright.

The Department of Animal Sciences offers courses of study leading to the degrees of Bachelor of Science in Animal Sciences, Master of Science in Animal Sciences, and Doctor of Philosophy (Animal Sciences). The department participates in the Joint Program for Animal Sciences and Veterinary Medicine, leading to the degrees of Bachelor of Science in Animal Sciences and Doctor of Veterinary Medicine.

Bachelor of Science in Animal Sciences

The Department of Animal Sciences provides training in the biological systems important to animals. Principles and practices associated with the management and well-being of agricultural animal production. Care and well-being of companion and laboratory animals are also taught. Animal Scientists at WSU are experts in animal nutrition, physiology, reproduction, genetics and genomics, nutrient management, meat and muscle biology, and animal behavior. They bring this expertise to the classroom and the experiential learning activities offered to the students. Unique hands-on learning with animals allows the students to practice and apply what they learn in the classroom. Most departmental faculty are engaged in the many multidisciplinary Centers across the WSU campus which provides additional broadening and experiential opportunities for undergraduate and graduate students.

The undergraduate curriculum prepares graduates for a wide variety of career paths. These paths include animal production and food processing (meats, dairy products, etc.); animal research; biomedical research; wild and zoological animal care; companion animal services; the agricultural service industries (including feed manufacturing and sales, pharmaceuticals, artificial insemination, agricultural equipment, financial institutions, etc.); and government agencies. Graduates of the Animal Sciences program are well prepared to continue their education by pursuing graduate or professional degrees in the sciences and veterinary and human medicine fields. Employers seek out graduates in Animal Sciences for their strong foundation in science, practical and technical knowledge of animal care, and hands-on experience with animal production.

Student Learning Outcomes

Upon completion of the Bachelor's Degree in Animal Sciences, it is expected that graduates will be able to:

- Develop and evaluate animal production and management systems by integrating knowledge of animal genetics, nutrition, reproduction, and other relevant disciplines and applying scientific and quantitative reasoning to solve real-world challenges.
- Locate, critically evaluate, and apply information from scholarly animal science literature and other sources to expand personal understanding and knowledge of animal sciences, providing a foundation for lifelong learning.
- Create and interpret graphs, tables and diagrams illustrating scientific data and concepts, and understand basic concepts relating to the design and analysis of research in the animal sciences.

- Communicate effectively, both orally and in writing, about animal sciences to a range of audiences using appropriate traditional and emerging media.
- Engage actively and effectively in discussion of complex issues relevant to animal sciences by understanding and appreciating:
 - the importance of animals to the health and well-being of society;
 - economic, environmental, animal welfare, and societal impacts of animal production and management systems at the local and global levels;
 - varied ethical perspectives on animal practices;
 - the role of science in informing debates.
- Appreciate the breadth and depth of professional opportunities in animal sciences relating to: the keeping of animals for food and fiber production and other purposes (e.g., species conservation, companionship, research and teaching, biotechnology, sports); the application of scientific principles to animal breeding, reproduction, feeding, growth and development, health management, housing, handling, and end-product safety and quality.

Degree Options in Animal Sciences

Students in Animal Sciences take a wide variety of agricultural and non-agricultural courses, receiving in-depth training in the comparative biology of farm and companion animals. Courses required by all undergraduate students in Animal Sciences include: AS 101 Introductory Animal Science, AS 180 Animal Science Orientation, AS 313 Feeds and Feeding, AS 330 Animal Genetics, AS 350, 351 Physiology of Reproduction, AS 380 Careers in Animal Science and a 400 level animal science production course. Students select an option to coincide with their interests. These options have required courses and electives which allow individual program specialization in areas of animal management or pre-veterinary medicine/science. The Animal Management curriculum is designed to provide students with the scientific, practical, and communication skills to make them productive members of the food production, animal care and related industries. The Pre-veterinary/Science option is designed to provide graduates with the skills to be successful in the biomedical or veterinary sciences, biotechnology or other science related fields.

The **Animal Management Option** emphasizes the business, economic and science-based practical management aspects of animal production and care of animals. This option is recommended for students preparing to work in agricultural animal production, companion animal care, or agribusiness.

The **Pre-veterinary/Science Option** places emphasis on basic science courses. This option is recommended for students planning to attend graduate school, apply to the professional program leading to the Doctor of Veterinary Medicine or other post-baccalaureate degree, or work in technical or specialized areas of animal science, such as extension, academia, research, technical consulting, or laboratory research.

Many opportunities outside the classroom are available for students to further their educational experiences. Animal Sciences students are encouraged to participate as part-time employees in the livestock centers, or in research and teaching programs within the department. Opportunities

are available to students for on-the-job training in professional internships within diverse segments of the agricultural, companion animal, veterinary, biomedical, or research sectors. The department offers experiential learning opportunities with dairy cattle, beef cattle, and swine that allow students to practice decision making and management skills. Active student clubs within the Department of Animal Sciences, the College of Agricultural, Human, and Natural Resource Sciences, and the university community provide students with both professional and social contacts with faculty and other students. Departmental and college scholarships are available based on ability, financial need and interest.

Animal Sciences courses are attractive to students in other majors and from any background. Animal Sciences courses broaden a student’s knowledge of applied and basic biology, agriculture and the environment, and society in general. Many students find that obtaining a minor in Animal Sciences complements and adds depth to other majors.

Transfer Students

Students planning to transfer to the Department of Animal Sciences, Washington State University, from community colleges or other institutions should complete as many science, mathematics, and University Common Requirements (UCORE) courses as possible prior to transferring. Inquiries about specific courses should be directed to the Undergraduate Academic Coordinator in the department.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

ANIMAL MANAGEMENT (120 HOURS)

A student may certify as an animal sciences major after completion of 24 semester hours, including ANIM SCI 101, and a cumulative GPA of 2.0 or better.

First Year

<i>First Term</i>	<i>Hours</i>
ANIM SCI 101	3
ANIM SCI 180	1
CHEM 101 [PSCI] or 105 [PSCI]	4
HISTORY 105 [ROOT]	3
MATH Requirement ¹	4

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI]	4
CHEM 102 or 106	4
ENGLISH 101 [WRTG]	3
H D 205 [COMM] (recommended) or other [COMM] course	4 or 3

Second Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 107 [BSCI]	4
Creative & Professional Arts [ARTS]	3
Lab Management Requirement ²	1
MATH Requirement and /or Electives ¹	6

<i>Second Term</i>	<i>Hours</i>
Business and Economics Course ³	3
ECONS 101 [SSCI]	3
Humanities [HUM]	3
STAT 212 [QUAN], 412, or PSYCH 311 [QUAN] ⁴	3 or 4
Electives	3
Complete Writing Portfolio	3

Third Year

<i>First Term</i>	<i>Hours</i>
ANIM SCI 313	4
ANIM SCI 330	3
ANIM SCI 380	1
ANIM SCI 399 or 499	1
ANIM SCI Group 1 Elective ⁵	2 or 3
Business and Economics Course ³	3

<i>Second Term</i>	<i>Hours</i>
ANIM SCI 350	3
ANIM SCI 351	1
ANIM SCI Group 1 Elective ⁵	3
Diversity [DIVR]	3
ENGLISH 301 or 402	3
VET CLIN 361, 367, or VET PH 308	3 or 4

Fourth Year

<i>First Term</i>	<i>Hours</i>
Ag Sciences Elective ⁶	3
ANIM SCI 464 [CAPS] [M] or 472 [M] ⁷	3
ANIM SCI Group 2 Electives ⁸	6
Electives	3

<i>Second Term</i>	<i>Hours</i>
ANIM SCI Group 2 Electives ⁸	6
Integrative Capstone [CAPS]	3
Electives	7 or 8

¹ MATH requirement may be satisfied by completing MATH 106 and 108, 140 [QUAN], or 171 [QUAN].

² Lab Management Requirement courses include (One course): ANIM SCI 166, 178, 280 (Spring-only), 172, or 174 (Fall-only).

³ Approved Business and Economics Electives include (Two courses): ACCTG 230; B LAW 210; ECONS 330, 335, 350, 351, 352, 450, and other courses as approved by advisor.

⁴ Students who have not yet completed a [QUAN] course should select STAT 212 or PSYCH 311.

⁵ ANIM SCI Group 1 Electives include (Two courses): ANIM SCI 260, 266, 274, 285, 314, 345, 346, 360, and other courses as approved by advisor.

⁶ Ag Sciences Electives are: any level AFS, AFTM, CROP SCI, ENTOM, FS, HORT, NATRS, and SOIL SCI course. To meet University requirements for upper division coursework, students may need to select a 300-400 level course.

⁷ ANIM SCI 474 may be taken as an alternative in Spring semester.

⁸ ANIM SCI Group 2 Electives must include one [M] course. Students may choose any of the following courses that have not been used to fulfill another requirement (Four courses): ANIM SCI 314, 345, 346, 360, 378, 408 [M], 440 [M], 451 [M], 454, 460, 473 [M], 474 [CAPS] [M], 478 [M], 485 [M], 488 [M], and other courses as approved by advisor.

JOINT PROGRAM IN ANIMAL SCIENCES AND VETERINARY MEDICINE (100 HOURS)

In order to meet the increasing demand for food-animal veterinarians, the Department of Animal Sciences and the College of Veterinary Medicine have created a combined program designed to train selected, highly qualified students to earn both a Bachelor of Science in Animal Sciences and a Doctor of Veterinary Medicine degree within a seven-year program. Students will take a three-year animal science program, completing all UCOREs, the animal sciences core, and pre-veterinary medicine requirements. This program includes mathematics; chemistry, including organic and biochemistry; general biology; physics; and the core of animal sciences courses, including an introduction to farm animals; then further education in animal feeds and nutrition, breeding and genetics, reproduction and the economics of animal production management. Students will then enter the College of Veterinary Medicine and complete the requirements for total hours and 300-400-level hours before earning the BS in Animal Sciences. Students will continue the curriculum, leading to the DVM degree after a total of seven years of college work.

Students will enter the university under normal procedures and must be advised in the Department of Animal Sciences. Qualified students will be invited to apply for the program. A high scholastic achievement and the promise of the same and demonstrated experience and interest in working with farm animals will be the primary criteria for initial invitation. Selected students will be identified and invited to apply for the AS-DVM program after the second semester of the first year. Students would then declare animal sciences as a major in the first semester of the sophomore year and enter the joint program in that year. The procedures for acceptance into the DVM program will be the same as those for other applicants. Successful participants will complete the three-year animal sciences program and begin the veterinary medicine curriculum in their fourth year of study. If the student is not accepted or withdraws from the AS-DVM program, the student could earn the BS in Animal Sciences and/or apply to the College of Veterinary Medicine under normal procedures.

Fourth-Seventh Years

Those students finishing all required classes would complete only the DVM curriculum from this point on. Most students will meet these requirements after one year of the DVM program. Successful completion of the College of Veterinary Medicine program will earn the Doctor of Veterinary Medicine.

First Year

<i>First Term</i>	<i>Hours</i>
ANIM SCI 101	3
ANIM SCI 172, 174, or 178	1
ANIM SCI 180	1
CHEM 105 [PSCI]	4
HISTORY 105 [ROOT]	3
MATH 107 or 140	4
<i>Second Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI]	4
CHEM 106	4

COM 102 [COMM] or H D 205 [COMM]	3
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3

Second Year

<i>First Term</i>	<i>Hours</i>
ANIM SCI Elective	3
BIOLOGY 107	4
CHEM 345	4
Diversity [DIVR]	3
Humanities [HUM]	3
<i>Second Term</i>	<i>Hours</i>
ECONS 101 [SSCI]	3
MBIOS 301	4
STAT 212 [QUAN]	4
VET PH 308	4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
ANIM SCI 313	4
ANIM SCI 330	3
ANIM SCI 380	1
ANIM SCI 440, 464, 472, or 488 [M]	3
ECONS 350	3
MBIOS 303	4
<i>Second Term</i>	<i>Hours</i>
ANIM SCI 350	3
ANIM SCI 351	1
ANIM SCI 408, 473, or 474 [CAPS] [M]	3
ANIM SCI 499	3
Integrative Capstone [CAPS]	3
PHYSICS 101	4

PRE-VETERINARY MEDICINE/SCIENCE (120 HOURS)

A student may certify as an animal sciences major after completion of 24 semester hours, including ANIM SCI 101, and a cumulative GPA of 2.0 or better.

First Year

<i>First Term</i>	<i>Hours</i>
ANIM SCI 101	3
ANIM SCI 180	1
CHEM 105 [PSCI]	4
HISTORY 105 [ROOT]	3
MATH Requirement ¹	3 or 4
<i>Second Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI]	4
CHEM 106	4
ENGLISH 101 [WRTG]	3
MATH Requirement, or Electives ¹	2 - 4

Second Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 107	4
CHEM 345	4
COM 102 [COMM] or H D 205 [COMM]	3 or 4
Creative & Professional Arts [ARTS]	3
<i>Second Term</i>	<i>Hours</i>
Humanities [HUM]	3
Lab Management Requirement ²	1
MBIOS 303	4

STAT 212 [QUAN], 412, or PSYCH 311 [QUAN] ³	3 or 4
Electives	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
ANIM SCI 313	4
ANIM SCI 330	3
ANIM SCI 380	1
MBIOS 301	4
200-300-level ANIM SCI Electives ⁴	3
<i>Second Term</i>	<i>Hours</i>
ANIM SCI 350	3
ANIM SCI 351	1
Diversity [DIVR]	3
ECONS 101 [SSCI]	4
PHYSICS 101	4
200-300-level ANIM SCI Electives ⁴	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
ANIM SCI 464 [CAPS] [M], 472 [M], or 474 [CAPS] [M]	3
ENGLISH 301 or 402 [M]	3
400-level ANIM SCI Electives ⁵	6
Electives	3
<i>Second Term</i>	<i>Hours</i>
ANIM SCI 399 or 499	1
BIOLOGY 324, VET CLIN 361, or VET PH 308	3 or 4
Integrative Capstone [CAPS], if needed, or Electives	3
400-level ANIM SCI Electives [M] ⁵	3
300-400-level Electives	7

¹ MATH requirement may be satisfied by completing MATH 106 and 108, 140 [QUAN], or 171 [QUAN].

² Lab Management Requirement courses include (One course): ANIM SCI 166, 178, 280 (Spring-only), 172, or 174 (Fall-only).

³ Students who have not yet completed a [QUAN] course should select STAT 212 or PSYCH 311.

⁴ Select two courses from: ANIM SCI 205, 260, 266, 274, 285, 314, 345, 346, 360, or as approved by advisor.

⁵ Select three courses from ANIM SCI 408 [M], 440, 451, 454, 460, 464 [M], 472 [M], 473 [M], 474 [M], 478 [M], 485 [M], or 488 [M] not used to fulfill a major requirement, or as approved by advisor. Students are required to complete two [M] courses to meet University requirements.

Minors

Animal Sciences

A minor in Animal Sciences requires a minimum of 16 credits of courses with the ANIM SCI prefix. At least 9 of the 16 credits must be upper-division, taken in residence at WSU or through WSU-approved education abroad or educational exchange courses, and include a minimum of 7 credits from the following list; ANIM SCI 313, 330, 350, and/or 351. In addition, students may use up to 4 credits of ANIM SCI 399 or 499. Students must maintain a minimum 2.0 GPA within ANIM SCI courses

to remain certified as an Animal Science minor. Students may apply for a minor in Animal Sciences once they have certified in a major and completed 60 credit hours.

Description of Courses

ANIMAL SCIENCES

ANIM SCI

- 101 Introductory Animal Science** 3 (2-3) Types and breeds of livestock, terminology, methods, management systems, techniques of animal and poultry production and consumer impact. Cooperative: Open to UI degree-seeking students.
- 166 Young Horse Handling** 1 (0-3) Course Prerequisite: ANIM SCI 101. Effective horse handling skills and techniques; safety for both horse and human will be emphasized and prioritized throughout the course. S, F grading.
- 172 Dairy Cattle Management Laboratory** 1 (0-3) Management practices associated with a dairy enterprise. Cooperative: Open to UI degree-seeking students. S, F grading.
- 174 Beef Cow Calf Management Laboratory** 1 (0-3) Management practices associated with a beef cow calf enterprise for students without experience. Cooperative: Open to UI degree-seeking students. S, F grading.
- 178 Swine Management Laboratory** 1 (0-3) Management practices associated with a swine enterprise. Field trip and special clothing required. Cooperative: Open to UI degree-seeking students. S, F grading.
- 180 Animal Sciences Orientation** 1 Animal sciences as a profession; career opportunities, curriculum, advisement, internships, externships, animal centers, special services centers, and course requirements.
- 205 [BSCI] Companion Animal Nutrition** 3 Biological concepts with application in nutrition of pet animals, including evolution and selection of pet species and their nutrient requirements.
- 260 Live Animal and Carcass Evaluation** 3 (1-6) Basic principles of live animal and carcass evaluation. Cooperative: Open to UI degree-seeking students.
- 266 Equine Management** 2 Foundational learning of best practices in equine management.
- 274 Beef Feedlot Systems** 2 (1-3) Overview of feeding management, feed milling and batching, animal health, and economics of the commercial cattle feeding business. One 1-day field trip. Cooperative: Open to UI degree-seeking students.
- 280 Animal Science and Society: Current Topics** 1 (0-2) A discussion of the products, science, and management of animal agriculture and how they relate to, and impact, society.
- 285 Rights and Welfare of Animals** 3 Ethical considerations and welfare of animals used as companions, for food, and in scientific research. Recommended preparation: BIOLOGY 102 or 106 or concurrent enrollment. Cooperative: Open to UI degree-seeking students.
- 313 Feeds and Feeding** 4 (3-3) Course Prerequisite: BIOLOGY 106; MATH 106, 107, 140, 171, 172, 182, or 202. Utilization, practices, requirements, nutritive characteristics, and calculations of rations for animals. Field trip required. Cooperative: Open to UI degree-seeking students.
- 314 Principles of Nutrition** 3 Course Prerequisite: BIOLOGY 107; CHEM 102 or 106. Digestion, absorption, metabolism, and function of nutrients. Cooperative: Open to UI degree-seeking students.
- 330 Animal Genetics** 3 (2-3) Course Prerequisite: BIOLOGY 107; STAT 212. Basic genetic concepts and methods for the genetic improvement of Mendelian and polygenic traits in animals. Cooperative: Open to UI degree-seeking students.
- 345 Introduction to Animal Growth and Development** 3 Course Prerequisite: ANIM SCI 101; BIOLOGY 106. Animal structure, composition, whole body and cellular growth, prenatal and postnatal growth; emphasis on skeletal muscle, bone and adipose tissue. Cooperative: Open to UI degree-seeking students.
- 346 Introduction to Skeletal Muscle Physiology** 3 Course Prerequisite: BIOLOGY 106. Structure, function and regulation of skeletal muscle; embryonic, neonatal, postnatal growth/atrophy; muscle-specific proteins. Cooperative: Open to UI degree-seeking students.
- 350 Physiology of Reproduction** 3 Course Prerequisite: BIOLOGY 106; BIOLOGY 107; CHEM 102 or 106. Anatomy and physiology of reproductive organs; hormones of reproduction; production of gametes; artificial insemination; fertilization; prenatal development; fertility and infertility. Cooperative: Open to UI degree-seeking students.
- 351 Physiology of Reproduction Laboratory** 1 (0-3) Course Prerequisite: ANIM SCI 350 or concurrent enrollment. Laboratory and field techniques used in animal reproduction involving hormones, artificial insemination, semen evaluation and pregnancy. Cooperative: Open to UI degree-seeking students.
- 360 Meat Science** 3 (2-3) Course Prerequisite: BIOLOGY 107. Anatomy, slaughter, classification, and processing of meat animal species. Special clothing and equipment required. Cooperative: Open to UI degree-seeking students.
- 378 Advanced Livestock and Meat Selection and Evaluation** 2 (0-6) May be repeated for credit. Course Prerequisite: ANIM SCI 260. Principles and practices of livestock and meat selection and evaluation. Off-campus and weekend participation required.
- 380 Careers in Animal Science** 1 Course Prerequisite: Certified major in Animal Sciences; junior standing. Issues and preparation for careers in animal sciences areas.
- 398 Cooperative Education Externship V** 2 (0-6) to 8 (0-24) May be repeated for credit; cumulative maximum 8 hours. Cooperative education externship in livestock production or related field. S, F grading.
- 399 Practicum V** 1-8 May be repeated for credit; cumulative maximum 12 hours. Directed internship in livestock production and related fields conducted at WSU centers on or off campus. S, F grading.
- 408 [M] Ruminant Nutrition** 3 Course Prerequisite: ANIM SCI 313. Anatomy, physiology, and metabolism in ruminant animals.
- 440 [M] Physiology of Domestic Animals** 3 Course Prerequisite: BIOLOGY 106; BIOLOGY 107. Basic animal functions; relationship and difference between domestic animals; measurement of functional processes.
- 451 [M] Endocrine Physiology** 3 Course Prerequisite: BIOLOGY 106; BIOLOGY 107; one of the following: ANIM SCI 440, BIOLOGY 352, MBIOS 303, or MBIOS 401. Anatomy, physiology, and biochemistry of endocrine systems and hormone action; emphasis on comparative, veterinary, and biomedical models. Credit not granted for both ANIM SCI 451 and ANIM SCI 551. Cooperative: Open to UI degree-seeking students.
- 454 Artificial Insemination and Pregnancy Detection** 2 (1-3) Course Prerequisite: ANIM SCI 351. Techniques in semen handling, insemination and pregnancy detection in cattle. Special clothing required. Cooperative: Open to UI degree-seeking students.
- 460 Advanced Meat Science** 3 (2-3) Course Prerequisite: CHEM 102 or 106; junior standing. Structure and development of skeletal muscle, postmortem biological changes, meat quality, meat processing, food safety, and meat industry. Cooperative: Open to UI degree-seeking students.
- 464 [CAPS] [M] Companion Animal Management** 3 (2-3) Course Prerequisite: Junior standing. Care and management of companion animal species throughout the life cycle, including nutrition, reproduction, exercise and behavior. Cooperative: Open to UI degree-seeking students.
- 472 [M] Dairy Cattle Management** 3 Course Prerequisite: ANIM SCI 313; ANIM SCI 330; ANIM SCI 350. Principles of breeding, feeding, and management of dairy cattle. Field trip required. Cooperative: Open to UI degree-seeking students.
- 473 [M] Advanced Dairy Management** 3 (1-6) Course Prerequisite: ANIM SCI 472. Current dairy record keeping and database management systems. Cooperative: Open to UI degree-seeking students.

- 474 [CAPS] [M] Beef Cattle Production 3 (2-3)**
Course Prerequisite: ANIM SCI 313; ANIM SCI 330; ANIM SCI 350. Breeding, feeding, and management; commercial and purebred enterprises; management of beef cattle on ranges, pastures and in the feedlot. Field trip required. Cooperative: Open to UI degree-seeking students.
- 478 [M] Swine Production 3 (2-3)**
Course Prerequisite: ANIM SCI 313; ANIM SCI 330; ANIM SCI 350. Principles of breeding, feeding, management, and marketing of swine. Field trips and special clothing required. Cooperative: Open to UI degree-seeking students.
- 480 Special Topics: Study Abroad V 1-15** May be repeated for credit. S, F grading.
- 485 [M] Applied Animal Behavior 3 (2-3)**
Course Prerequisite: BIOLOGY 106; BIOLOGY 107; STAT 212; junior standing. Application of scientific principles governing animal behavior to practical aspects of animal housing, breeding, handling, training, and care. Cooperative: Open to UI degree-seeking students.
- 488 [M] Perspectives in Biotechnology 3**
Course Prerequisite: MBIOS 301 or ANIM SCI 330. Theory and application of biotechnology in agriculture, industry, and medicine; methodological, environmental, social, and economic concerns. Credit not granted for both ANIM SCI 488 and ANIM SCI 588. Cooperative: Open to UI degree-seeking students.
- 495 Research in Animal Sciences V 1-4** May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: Junior standing. Planned and supervised undergraduate research experience.
- 499 Special Problems V 1-4** May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 500 Seminar in Animal Sciences 1** May be repeated for credit. Current developments in animal sciences.
- 501 Milk, Meat, and Methane: Contemporary Animal Production Issues 3** Provides knowledge and understanding of livestock issues that affect contemporary livestock production.
- 504 Special Topics V 1-4** May be repeated for credit; cumulative maximum 12 hours.
- 507 Advanced Nutrient Metabolism 3** Advanced topics in metabolic regulation of carbohydrate, fat and amino acid use by animals.
- 510 Digestion and Nutrient Utilization in Animals 3 (2-3)** Gastrointestinal physiology, rate of passage, feed intake regulation, measures of digestibility, starch, fat and nonstarch polysaccharide, and digestion and utilization of nutrients.
- 513 Mineral and Vitamin Metabolism 4** Absorption, excretion, metabolism, dietary requirements and interactions of minerals and vitamins in animals and humans. Cooperative: Open to UI degree-seeking students.
- 520 Preparation of Scientific Literature in Animal Sciences 2** Preparation of grant proposals, manuscripts, and literature reviews on research topics.
- 528 Topics in Animal Breeding 2** May be repeated for credit; cumulative maximum 4 hours. Systems of selection and mating for genetic improvement in farm animals.
- 551 [M] Endocrine Physiology 3** Anatomy, physiology, and biochemistry of endocrine systems and hormone action; emphasis on comparative, veterinary, and biomedical models. Credit not granted for both ANIM SCI 451 and ANIM SCI 551. Cooperative: Open to UI degree-seeking students.
- 558 Molecular and Cellular Reproduction 3 (2-2)** State of the art concepts of the molecular, cellular, and physiological aspects of mammalian reproduction. (Crosslisted course offered as MBIOS 528, ANIM SCI 558). Cooperative: Open to UI degree-seeking students.
- 581 Stem Cell Biology, Therapeutics and Regenerative Medicine 3** Provides information on the latest cutting edge research in the areas of stem cell biology and tissue regeneration; covers stem cell therapeutics, gene transfer vectors and methods for isolating, characterizing, and generating stem cells. (Course offered as PHARMSCI 581, ANIM SCI 581).
- 582 Seminar in Reproductive Biology 1** Current developments in reproductive biology. Cooperative: Open to UI degree-seeking students. S, F grading.
- 588 [M] Perspectives in Biotechnology 3** Theory and application of biotechnology in agriculture, industry, and medicine; methodological, environmental, social, and economic concerns. Credit not granted for both ANIM SCI 488 and ANIM SCI 588. Cooperative: Open to UI degree-seeking students.
- 598 Advanced Topics in Animal Sciences V 1-2** May be repeated for credit. Recent research in various disciplines of animal sciences. Cooperative: Open to UI degree-seeking students.
- 700 Master's Research, Thesis, and/or Examination V 1-18** May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 800 Doctoral Research, Dissertation, and/or Examination V 1-18** May be repeated for credit. Course Prerequisite: Admitted to the Animal Sciences PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Department of Anthropology

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College Hall 150
509-335-3441

Professor and Department Chair, A. Duff; Professors, W. Andrefsky, Jr., B. S. Hewlett, T. A. Kohler, J. M. Mageo, S. A. Weber; Associate Professors, C. Grier, E. Hagen, N. P. McKee, C. L. Meehan, M. B. Quinlan,, R. J. Quinlan, C. Wilkinson-Weber; Assistant Professors, J. Cassaniti, J. d'Alpoim Guedes, L. Premo, E. Thornton; Professors Emeriti, R. E. Ackerman, J. H. Bodley, W. D. Lipe.

The curriculum includes courses in the four major subfields of anthropology: archaeology, cultural/social anthropology, linguistic anthropology, and physical/biological anthropology. These courses familiarize students with current issues in human evolution, linguistics, the prehistoric development of culture, and cultural theory. Undergraduate majors are required to gain a background in all four of these major subfields. Graduate students may specialize in archaeology, cultural anthropology, or evolutionary anthropology. The program in archaeology emphasizes research and training in the prehistory of the Americas, with additional strengths in South Asia, China, Japan, and Korea. Faculty research employs ceramic analysis, paleoeconomic and paleoenvironmental approaches including geoaerchaeology, zooarchaeology, and macrobotanical analysis, as well as stable isotope analysis, archaeometry via gas chromatography-mass spectrometry, and modeling and simulation. The department also conducts summer archaeological field schools. The program in cultural anthropology emphasizes globalization, historical ethnography, psychological anthropology, medical anthropology, gender and culture, biocultural perspectives, and public health anthropology. The public health anthropology emphasis is part of the Peace Corps Master's International Program. Faculty research is based in North and South America, Polynesia, Sub-Saharan Africa, and South and Southeast Asia. The program in evolutionary anthropology emphasizes evolutionary psychology, behavioral ecology, evolutionary cultural anthropology, evolutionary archaeology and paleoanthropology. Evolutionary faculty have research interests that span several continents including the Americas, Europe and Africa. The department also emphasizes research and training in Psychological/Medical Anthropology and Ethnobiology.

Departmental offices and laboratories are located in College Hall near the center of campus. Physical facilities include special laboratories for physical anthropology, isotope and lithic analysis, paleoecology, geoaerchaeology, and zooarchaeology, as well as research laboratories for faculty and advanced students. The Museum of Anthropology, with permanent and temporary exhibits, and ethnographic and archaeological research collections, is also housed in College Hall.

The department offers courses of study leading to the degrees of Bachelor of Arts in Anthropology, Master of Arts in Anthropology, and Doctor of Philosophy (Anthropology). Positions open to anthropologists include those in teaching, research,

museum work, state and federal agencies, private consulting firms, and international business. In addition, anthropology provides a strong general foundation for a pre-professional education.

Student Learning Outcomes

We expect that our graduating students will have:

1. Familiarity with the basic principles and findings of ethnology, archaeology, physical anthropology, and linguistics, the four subfields of American anthropology as well as the ways in which these four subfields are interrelated;
2. Awareness of the basic research and analytical methods and underlying theories of the four subfields of anthropology;
3. Ability to read critically and synthesize information produced by professional anthropologists and published in academic books and journals;
4. Ability to write in accessible, standard, academic prose narratives that are marked by: a framework of clear, general statements; specific, concrete evidence that supports these statements; analysis and discussion of the material presented; and a coherent summary conclusion, indicating the significance of the work;
5. Ability to apply the principles, findings, and research and analytical methods of anthropology to new situations and data, including those of everyday life.

See <http://libarts.wsu.edu/anthro/UndergraduateStudies/undergraduate.erninggoals.html>.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

ANTHROPOLOGY (120 HOURS)

A minimum of 34 hours in anthropology courses are required. Grades of C- or higher are required for all anthropology courses. No required course can be taken pass, fail.

First Year

<i>First Term</i>	<i>Hours</i>
ANTH 203 [DIVR]	3
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
Communication [COMM] or Written Communication [WRTG]	3
ENGLISH 101 [WRTG]	3
Foreign Language, if necessary, or Elective ²	3 or 4

<i>Second Term</i>	<i>Hours</i>
ANTH 260	4
Foreign Language, if necessary, or Elective ²	3 or 4
HISTORY 105 [ROOT]	3
Quantitative Reasoning [QUAN] ³	3 or 4

Second Year

<i>First Term</i>	<i>Hours</i>
ANTH 230	3
Creative & Professional Arts [ARTS]	3

Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4
Social Sciences [SSCI]	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
ANTH Electives ⁴	6
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
Electives	6
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
ANTH 390 [M]	3
ANTH Elective ⁴	3
Humanities [HUM]	3
Electives	6

<i>Second Term</i>	<i>Hours</i>
300-400-level Electives ⁵	9
ANTH Electives ⁴	6
Consider study abroad or summer field school	

Fourth Year

<i>First Term</i>	<i>Hours</i>
300-400-level Electives ⁵	12
ANTH Elective ⁴	3

<i>Second Term</i>	<i>Hours</i>
300-400-level Electives ⁵	9
ANTH 490 [CAPS] [M]	3
Electives	3

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² Two years of one foreign language from high school or one year at college required.

³ STAT 212 preferred.

⁴ 18 hours of ANTH courses required. Minimum of 3 hours credit from each of the following areas: Archeology: ANTH 300, 330, 331, 334, 336, 340, 370, 430 [M]; Biological: ANTH 380, 463, 465, 468; Cultural: ANTH 300, 303, 306, 307, 309, 316, 320, 327, 402, 404, 405, 417, 418; Linguistics: ANTH 350, 450.

⁵ Concentrating electives beginning in the junior year in one subarea of anthropology or in a minor discipline in consultation with the adviser is recommended.

Minors

Anthropology

A student with 60 semester hours may certify a minor. A minor requires a minimum of 18 semester hours in anthropology, including three of the following: ANTH 101, 203, 230, and 260. At least 9 hours must be 300-400-level work taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. A minimum grade of C- is required in each course contributing to the minor.

Description of Courses

ANTHROPOLOGY

ANTH

101 [DIVR] General Anthropology 3 Major subfields of anthropology; physical (human evolution and race), cultural-social, archaeology, and linguistics.

130 [SSCI] Great Discoveries in Archaeology 3 Impact of great archaeological discoveries and the work of archaeologists on our sense of the past.

201 [HUM] Art and Society 3 Art as an expression of social and cultural systems in non-Western societies.

203 [DIVR] Peoples of the World 3 Principles of cultural anthropology through study of various ethnic groups from different parts of the world.

214 [SSCI] Gender and Culture in America 3 Exploration or variation in gender roles, relationships, values, and institutions among men and women in US, ethnic, and other subcultures.

230 Introduction to Archaeology 3 Development of a dynamic picture of past human behavior from archaeological evidence.

260 [BSCI] Introduction to Biological Anthropology 4 (3-3) Evidence for human evolution; evolutionary explanations of human variation; techniques of biological anthropology.

275 Special Topics: Study Abroad V 1-15 May be repeated for credit. S, F grading.

300 Field Methods V 2-8 Course Prerequisite: By instructor permission. Practice in methods of archaeological, ethnological, or linguistic field research.

301 [ARTS] Arts and Media in Global Perspective 3 Contemporary arts and media around the world, and their impact on identity, society, and culture.

302 [SSCI] Childhood and Culture 3 Anthropological theory and methods applied to the study of infant, child, and adolescent development.

303 Religious Experience 3 Body, meaning, and power in religion cross culturally.

306 Cultures and Peoples of the Middle East 3 Contemporary Arab cultures in a historical perspective within the framework of Western-Middle Eastern relations. (Crosslisted course offered as ANTH 306, ASIA 306, HISTORY 306).

307 [DIVR] Contemporary Cultures and Peoples of Africa 3 Introduction to family, social, political, economic and religious institutions of African cultures in context of African social issues.

309 [SSCI] Cultural Ecology 3 Major findings of ecological anthropology relating to problems of population, resources, and environment in small-scale cultures. Recommended preparation: Sophomore standing, ANTH 101 or 203.

- 312 Indigenous Women in Traditional and Contemporary Societies** 3 Course
Prerequisite: One of ANTH 101, 214, CES 101, 171, or WOMEN ST 101, or WOMEN ST 201. Exploration of roles and activities of women in indigenous societies; how traditional gender roles have developed and changed. (Crosslisted course offered as CES 372, ANTH 312, WOMEN ST 372).
- 316 [DIVR] Gender in Cross Cultural Perspective** 3 Cross-cultural examination of the status and roles of women and men, sexuality and marriage, and folk concepts of sexual anatomy in traditional cultures in Western science; concepts of nature and culture are explored through a variety of perspectives. (Crosslisted course offered as ANTH 316, WOMEN ST 316). Recommended preparation: Sophomore standing; ANTH 101, PSYCH 105, SOC 101, or WOMEN ST 101 or 201.
- 317 Global Feminisms** 3 An interdisciplinary approach to examining women's roles and experiences throughout the world and different approaches to feminism/feminisms. (Crosslisted course offered as WOMEN ST 332, ANTH 317).
- 320 Native Peoples of North America** 3 A culture history/culture area study of native North America. (Crosslisted course offered as ANTH 320, CES 377).
- 327 [DIVR] Contemporary Native Peoples of the Americas** 3 Contemporary cultures of Native American communities emphasizing North America. (Crosslisted course offered as ANTH 327, CES 378). Recommended preparation: ANTH 101 or CES 171.
- 330 Origins of Culture and Civilization** 3 Prehistoric roots of culture from the beginnings of humankind to the rise of the first civilizations in Africa and Eurasia. Recommended preparation: 3 hours ANTH.
- 331 [SSCI] America Before Columbus** 3 Cultures and environments of North/Middle America from the arrival of the earliest hunter-gatherers to the complex Mayan and Aztec civilizations. Recommended preparation: ANTH 101.
- 334 Time and Culture in the Northwest** 3 The archaeologically reconstructed environmental and cultural past of the Northwest including contemporary scientific and social approaches and issues. Recommended preparation: ANTH 101.
- 336 Old World Civilizations** 3 Evolution of complex society, urbanism, states and empires in the eastern hemisphere; survey of European, African and Asian civilizations. Recommended preparation: ANTH 101, 230, or 330.
- 340 [M] Maya, Aztec and Inca Civilizations** 3 Examination of the great prehistoric civilizations of Mesoamerica and South America. Recommended preparation: ANTH 101, 330, or 336.
- 350 [DIVR] Speech, Thought, and Culture** 3 The role of language in social situations and as a reflection of cultural differences. (Crosslisted course offered as ANTH 350, FOR LANG 350).
- 370 Past Environments and Culture** 3 People and their environments from the Ice Age to modern time; archaeological, ecological, and biological data.
- 380 Introduction to Osteology** 3 Introduction to the field of osteology including molecular analysis, paleopathology, taphonomy and forensic analysis.
- 381 [BSCI] Primate Behavioral Ecology** 3 Evolution of primate behavior from ecological and phylogenetic perspective emphasizing methods for understanding primate adaptations and diversity. Recommended preparation: ANTH 101 or BIOLOGY 101, 102 or 150.
- 390 [M] History of Anthropological Thought** 3 Course Prerequisite: ANTH 203; ANTH 230; ANTH 260. Development of theories in anthropology including contributions of significant individuals, representative classics and influential current movements. Recommended preparation: Junior standing.
- 395 Topics in Anthropology** V 3-6 May be repeated for credit; cumulative maximum 6 hours. Examination of selected topics in contemporary anthropological theory and practice. Recommended preparation: Junior standing.
- 399 Archaeological Field School** V 2-8 Course Prerequisite: By instructor permission. Training in methods of archaeological data recovery and analysis.
- 402 Cross-cultural Gender and Kinship** 3 Principles of kinship in anthropology applied to questions of cross-cultural gender definition. Recommended preparation: ANTH 101 or SOC 101.
- 404 [CAPS] The Self in Culture** 3 Course Prerequisite: One course at the 100-level and one course at the 200-level in any of the following subjects: AMER ST, ANTH, CES, COM, ENGLISH, FINE ART, H D, HISTORY, HUMANITY, PHIL, POL S, PSYCH, SOC, or WOMEN ST; junior standing. Survey of anthropological theories exploring self in Western/non-Western cultures through dreams, history, and human development.
- 405 Medical Anthropology** 3 Relationships among disease, curing, culture and environment; non-Western medical systems; political economy of health care. Recommended preparation: Junior standing.
- 406 Anthropology of Epidemic Disease and Bioterrorism** 3 Human and world response to epidemics, cultural contexts terrorism, biocultural approaches to epidemic disease, bioterrorism in human history.
- 410 History of American Indian Sovereignty and Federal Indian Law** 3 The history of sovereignty and Federal Indian Law against the backdrop of treaties and trust responsibility. (Crosslisted course offered as HISTORY 410, ANTH 410, POL S 410).
- 417 Anthropology and World Problems** 3 Data and methods of cultural anthropology applied to the solution of contemporary human problems, emphasizing sustainable development. Recommended preparation: 3 hours ANTH; junior standing.
- 418 Human Issues in International Development** 3 Interdisciplinary analysis of complex interaction between tradition and modernity in Third World societies. (Crosslisted course offered as ANTH 418, POL S 418, SOC 418).
- 430 [M] Introduction to Archaeological Method and Theory** 3 Archaeological theory in anthropological perspective; current trends in method and theory in American archaeology. Recommended preparation: ANTH 230; 330 or 331.
- 450 Descriptive Linguistics** 3 Introduction to analysis and description of natural languages; phonological, syntactic, and semantic analysis of data from a variety of languages. (Crosslisted course offered as ANTH 450, FOR LANG 450). Cooperative: Open to UI degree-seeking students.
- 463 Anthropology of Life and Death** 3 Demography, dynamics of evolution, human ecology, and their relationships to the biology of living, historical, and archaeological populations. Credit not granted for both ANTH 463 and ANTH 563. Recommended preparation: ANTH 260. Cooperative: Open to UI degree-seeking students.
- 465 Human Evolution** 3 Human origins in the light of the fossil record and evolutionary theory. Credit not granted for both ANTH 465 and ANTH 565. Recommended preparation: ANTH 260. Cooperative: Open to UI degree-seeking students.
- 468 Sex, Evolution, and Human Nature** 3 Human sexuality, male-female relations, cooperation, violence and parent-child relations examined cross-culturally and in nonhuman primates utilizing evolutionary and biocultural perspectives. Recommended preparation: Junior standing; 3 hours ANTH or BIOLOGY.
- 469 Genes, Culture and Human Diversity** 3 Relationships between genes, language and culture are explored as a means to understanding world history, genetic and cultural diversity and unity. Recommended preparation: Junior standing.
- 473 [CAPS] [M] Evolution and Society** 3 Course Prerequisite: ANTH 260 or BIOLOGY 301; junior standing. Survey of how evolutionary theory is used to better understand ourselves and the societies in which we exist and interact with others. (Crosslisted course offered as BIOLOGY 473, ANTH 473).
- 480 Special Topics: Study Abroad** V 1-15 May be repeated for credit. S, F grading.
- 490 [CAPS] [M] Integrative Themes in Anthropology** 3 Course Prerequisite: ANTH 203; ANTH 230; ANTH 260; ANTH 390; junior standing. Current research crosscutting traditional subdisciplines of anthropology.

- 495 Research Practicum V 1-6** May be repeated for credit; cumulative maximum 10 hours. Hands-on experience in selection of a research problem, review of literature, developing methodology, data collection, and reporting results.
- 498 Anthropology Internship V 1-15** May be repeated for credit; cumulative maximum 15 hours. Course Prerequisite: By instructor permission. Participation as archaeological or cultural anthropological intern in public or private sectors; requires special arrangement with faculty advisor. S, F grading.
- 499 Special Problems V 1-4** May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 500 Field Methods V 2 (0-6) to 8 (0-24)** Course Prerequisite: By instructor permission. Training in gathering and analyzing field data.
- 504 Culture, Ecology, and International Development 3** Sociocultural properties of ecological systems in developing nations; cultural transformation in dynamic systems; ethnographic description, comparison; mixed and collaborative methods.
- 507 Advanced Studies in Culture Theory 3** May be repeated for credit; cumulative maximum 6 hours. Evaluation of major theories and methods and their relationship to problems in cultural-social analysis.
- 510 Fundamentals of Cultural Anthropology 3** Overview of basic concepts and theory in cultural anthropology based on in-depth analysis of selected theoretical and ethnographic materials.
- 513 Lithic Technological Organization 4 (3-3)** Methods and theory of lithic technology.
- 514 Ceramic Analysis 4 (3-3)** Basic concepts, methods, and approaches used in the analysis of archaeological pottery.
- 519 International Development and Human Resources 3** History of and recent changes in international development emphasizing anthropological perspectives. (Crosslisted course offered as ANTH 519, POL S 538, SOC 519).
- 521 Psychological Anthropology 3** Psychological and anthropological aspects of personhood, self, human development, gender, sexuality, emotion and cognition in various cultures.
- 522 Culture and Mind 3** Examination of cultural variation in mind and mental processing, and how shared ideas and personal perceptions are necessarily co-constitutive of one another.
- 525 Medical Anthropology 3** Examination of the interactions between culture and well-being, including illness concepts, distributions, prevention, and treatments in global perspective.
- 528 Historical Ethnography 3** May be repeated for credit; cumulative maximum 9 hours. Culture history, ethnography, theoretical, and contemporary problems of selected culture areas.
- 529 Seminar in Ethnography 3** May be repeated for credit; cumulative maximum 6 hours. Methodological, stylistic and craft issues in the process and product of ethnography.
- 530 Archaeological Method and Theory 3** History of archaeological method and theory; analysis of current literature.
- 535 Cultural Resource Management 3** Role of archaeology in historic preservation and resource conservation; legal and institutional frameworks; research and interpretation in a CRM context. Cooperative: Open to UI degree-seeking students.
- 537 Quantitative Methods in Anthropology 4 (3-3)** May be repeated for credit; cumulative maximum 8 hours. Sampling, exploratory data analysis, inferential statistics, and use of statistical software in anthropological research.
- 539 Prehistory of the Southwest 3** Prehistory of the American Southwest; emphasis on Pueblo, Mogollon and Hohokam traditions and relationships to historic native groups.
- 540 Prehistory of the Northwest Coast 3** Prehistoric cultures, chronologies, and interrelationships on the northwest coast of North America.
- 543 Prehistory of the Plateau and Basin 3** Archaeology of the interior Northwest and Great Basin.
- 546 Complexity in Small Scale Societies 3** Seminar focused on classic literature and current issues relevant to complexity in small scale societies, predominately covering hunter-gatherer systems. Recommended preparation: ANTH 530.
- 547 Models and Simulation 3** Models and model-building as an anthropological approach to present and past cultures.
- 548 Hunters and Gatherers: Past and Present 3** Introduction to hunter-gatherer studies in anthropology and archaeology exploring uses of evolutionary approaches to modeling and reconstructing hunter-gatherer behavior in contemporary and prehistoric contexts.
- 549 Settlement and Agro-Pastoralism 3** Development of settled communities and food production through evaluation of their social, economic and spatial configurations. Recommended preparation: ANTH 530.
- 550 Descriptive Linguistics 3** Introduction to analysis and description of natural languages; phonological, syntactic, and semantic analysis of data from a variety of languages. (Crosslisted course offered as ANTH 450, FOR LANG 450). Cooperative: Open to UI degree-seeking students.
- 554 Anthropological Field Methods Seminar 3** Elicitation, recording techniques and analysis of sociocultural and linguistic field data. Recommended preparation: ANTH 450 or 550.
- 561 Current Trends in Physical Anthropology 3** May be repeated for credit. Intensive review of major current trends in physical anthropology. Recommended preparation: ANTH 465.
- 562 Evolutionary Method and Theory in Anthropology and Archaeology 3** A graduate-level seminar-based course focusing on the evolutionary analysis of past and present human behavior.
- 563 Anthropology of Life and Death 3** Demography, dynamics of evolution, human ecology, and their relationships to the biology of living, historical, and archaeological populations. Credit not granted for both ANTH 463 and ANTH 563. Recommended preparation: ANTH 260. Cooperative: Open to UI degree-seeking students.
- 564 Advances in Evolution and Human Behavior 3** Recent trends in the study of evolution and human behavior.
- 565 Human Evolution 3** Human origins in the light of the fossil record and evolutionary theory. Credit not granted for both ANTH 465 and ANTH 565. Recommended preparation: ANTH 260. Cooperative: Open to UI degree-seeking students.
- 567 Primate Behavioral Ecology 3** Seminar-based course focusing on evolutionary analysis of primate behavior, morphology and ecology.
- 568 Research Design and Grant Writing 3** Project development, research design, and successful proposal writing.
- 569 Evolutionary Cultural Anthropology 3** Evolutionary nature of culture and its interactions with human biology (genes) and ecology.
- 570 Sediments in Geoarchaeology 4 (3-3)** Sediment-forming processes, sedimentological techniques, reconstruction of Quaternary environments, and sedimentology of site-forming processes.
- 573 Zooarchaeology 4 (2-6)** Identification of animal bones from archaeological sites, methodological and theoretical techniques for interpreting faunal remains. Cooperative: Open to UI degree-seeking students.
- 576 Paleoethnobotany 4 (3-3)** Methods of analysis and interpretation of botanical remains recovered from archeological sites, including pollen, phytoliths, starch, wood, and macro-botanical remains.
- 581 Comparative Biology of Social Traditions 3** Phylogenetic and modeling perspectives used to examine the evolution of social learning and cultural transmission in humans and other animals. (Crosslisted course offered as ANTH 581, BIOLOGY 581).
- 591 Special Topics in Anthropology 3** May be repeated for credit; cumulative maximum 9 hours. Examination of current areas of anthropological theory and research.
- 593 Publishing and Professional Communication 3** Preparation of original research reports; survey of types of professional communication, and of standards and techniques.

596 IPEM Seminar 1 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: By permission only. Symposia and project work sessions for the WSU/UW IGERT: Program in Evolutionary Modeling. (Crosslisted course offered as ANTH 596, BIOLOGY 598). S, F grading.

598 Advanced Anthropology Internship V 1-15 May be repeated for credit; cumulative maximum 15 hours. Course Prerequisite: By instructor permission. Participation as archaeological or cultural anthropological intern in public or private sectors; requires special arrangement with faculty advisor. S, F grading.

599 Archaeological Field School V 2-8 Course Prerequisite: By instructor permission. Training in methods of archaeological data recovery and analysis.

600 Special Projects or Independent Study V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.

700 Master's Research, Thesis, and/or Examination V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Anthropology PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Department of Apparel, Merchandising, Design and Textiles

amdt.wsu.edu
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509-335-1233

Associate Professor and Department Chair, J. Ellis; Professor, L. Bradley; Associate Professors, T. Chi, C. Salusso; Assistant Professors, D. Christel, H. Liu, J. Son; Instructors, P. Brown-Hayes, A. Hughes, A. Rawlings.

Apparel, Merchandising, Design and Textiles offers Bachelor and Master of Arts degrees, and also participates in the Interdisciplinary Doctoral Program.

As the largest and most comprehensive 4-year apparel and textiles program that offers a full Apparel

Design program and an in-depth Merchandising program in Washington, we offer students all of the tools necessary to succeed in the fashion, textiles and apparel industry. We have state of the art classroom and laboratory equipment, fully equipped apparel design studios, a program and curriculum aligned with industry, and nationally and internationally recognized faculty who challenge students to understand all the aspects of the discipline. Students in the AMDT department graduate with a thorough understanding of the interdisciplinary nature of the apparel and textile industry across the supply chain. The curriculum options are designed to teach students to:

- Recognize the global world that we live in today by understanding dynamic and diverse political, socio-cultural, and economic systems and how they impact human behavior and industry processes in a global economy.
- Increase knowledge of the Industry by applying industry relevant decision making and creative processes in the selection, production and placement of goods and services that meet consumer needs in the textile, apparel & retail complex using industry best practices.
- Utilize technology by applying knowledge and skills regarding current technology to retrieve, analyze and disseminate information, and develop solutions relevant to the textile, apparel, and retail complex.
- Improve verbal, visual, and written communication skills by demonstrating the ability to effectively communicate ideas verbally, visually and in writing as team members and/or leaders within a professional environment.
- Think analytically and critically by demonstrating analytical and critical thinking skills to recognize problems, collect, analyze, synthesize information, develop, evaluate and implement solutions.
- Develop an understanding of sustainable practices by understanding environmentally sound, economically viable, and socially supportive sustainable practices in the textile, apparel and retail complex.

Students majoring in Apparel, Merchandising, and Textiles can choose an emphasis in apparel design or merchandising. Each option includes the program's core courses, as well as option requirements and electives. Students can individualize their expertise by exploring minors and supporting work in business administration, communication, and fine arts.

An internship is a valuable way to gain experience and contacts in the industry. Having an internship makes students much more competitive when they graduate and many internships lead to job opportunities after graduation. There are thousands of companies in the U.S. and abroad that offer internships in the textile and apparel field. Internship exposures help students gain work experience, better their understanding of the industry, and determine what career path is best for them.

Normally the applicant for graduate study should have an undergraduate major in apparel, merchandising, design, or textiles. However, candidates with a good record in related fields (such as business, economics, marketing, psychology, sociology, and etc.) may be well prepared for certain areas of advanced study. All graduate students must show competency in their area of study (through

an undergraduate degree or industry experience) in order to earn their degree. Please refer to WSU Graduate catalog and web site at <http://www.gradschool.wsu.edu>.

Student Learning Outcomes

The goal of Apparel, Merchandising, Design and Textiles is to provide high-quality education that prepares graduates for success in the fashion, retail, textiles and apparel industry. State of the art classroom equipment, fully equipped apparel design studios, a program and curriculum aligned with industry, and nationally and internationally recognized faculty, give the students in WSU's AMDT program a learning advantage.

You may find all Student Learning outcomes at: <http://amdt.wsu.edu/undergraduate/outcomes>

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

APPAREL DESIGN (120 HOURS)

Apparel design focuses on the interaction between design and merchandising and offers depth in apparel design. Students typically complete a minor in Fine Art and/or Business Administration.

Students wishing to certify in apparel merchandising, and textiles must have a minimum 2.50 cumulative GPA. Students must receive a C or better grade in all AMDT courses and MKTG 360. A course may only be repeated once. Courses required in these programs cannot be taken on a pass, fail basis. To maintain certification, a 2.50 cumulative GPA is required each semester. Independent study and internship courses (AMDT 490, 495, 498) will not be included in GPA calculations. Students dropping below a 2.50 GPA will be de-certified and can reapply when their GPA is 2.50 or above. Students interested in the apparel design option are accepted through a portfolio review process. Applications are available in the main office and need to be submitted during the spring semester of the second year. Transfer student who have completed two years of college may submit an application during the summer prior to the first semester of attendance at WSU for consideration.

First Year

First Term	Hours
AMDT 108	3
Biological Sciences [BSCI] or SCIENCE 101 [SCI] ¹	3 or 4
COM 102 [COMM] or H D 205 [COMM] recommended	3 or 4
HISTORY 105 [ROOT]	3
Quantitative Reasoning [QUAN]	3

Second Term	Hours
AMDT 208	3
ENGLISH 101 [WRTG]	3
Humanities [HUM]	3
Physical Sciences [PSCI] or SCIENCE 102 [SCI] ¹	4 or 3
Electives	3

Second Year

<i>First Term</i>	<i>Hours</i>
AMDT 210	4
AMDT 211	3
AMDT 220	3
Electives	5

<i>Second Term</i>	<i>Hours</i>
AMDT 212	3
AMDT 368	3
Creative & Professional Arts [ARTS]	3
ECONS 101 [SSCI]	3
Electives	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
AMDT 310	4
AMDT 311	3
AMDT 314	3
AMDT 488	1
AMDT Elective ²	3

<i>Second Term</i>	<i>Hours</i>
AMDT 312	3
AMDT 420 [M]	3
AMDT 492	3
MKTG 360	3
Electives	3

<i>Third Term</i>	<i>Hours</i>
AMDT 490 ³	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
AMDT 318	3
AMDT 411	3
AMDT 417 [DIVR]	3
AMDT Electives ²	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
AMDT 412	3
AMDT 413 [CAPS] [M]	3
AMDT Electives ²	3
Electives	3

¹ For a total of 7 credits—one Biological Science [BSCI] and one Physical Science [PSCI] course, including one lab course, or 8 credits of [SCI] designated courses. (SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI], which is offered Spring semester.)

² Approved AMDT Electives include any AMDT course not used to fulfill major requirements or as approved by advisor.

³ AMDT 490 typically offered Fall, Spring, and Summer terms.

MERCHANDISING (120 HOURS)

Merchandising includes courses designed to allow students to develop competence in the planning, buying, and selling of merchandise in either manufacturing or retail organizations. Curriculum includes a focus on marketing. Students often pursue one of the minors in Business.

Students wishing to certify in apparel merchandising, and textiles must have a minimum

2.50 cumulative GPA. Students must receive a C or better grade in all AMDT courses, MKTG 360, and the business industry elective. A course may only be repeated once. Courses required in these programs cannot be taken on a pass, fail basis.

First Year

<i>First Term</i>	<i>Hours</i>
AMDT 108	3
Biological Sciences [BSCI] or SCIENCE 101[SCI] ¹	3 or 4
COM 102 [COMM] or H D 205 [COMM] recommended	3
ENGLISH 101 [WRTG]	3
Quantitative Reasoning [QUAN]	3

<i>Second Term</i>	<i>Hours</i>
AMDT 208	3
HISTORY 105 [ROOT]	3
Humanities [HUM]	3
Physical Sciences [PSCI] or SCIENCE 102 [SCI] ¹	4 or 3
Electives	3

Second Year

<i>First Term</i>	<i>Hours</i>
AMDT 210	4
ECONS 101 [SSCI]	3
Electives	6

<i>Second Term</i>	<i>Hours</i>
ACCTG 230	3
AMDT 212	3
Electives	9
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
AMDT 307	3
AMDT 318	3
AMDT 488	1
Creative & Professional Arts [ARTS]	3
AMDT Electives ²	3

<i>Second Term</i>	<i>Hours</i>
AMDT 314	3
AMDT 420 [M]	3
AMDT 440	3
Business Industry Elective ³	3
AMDT Electives ²	3

<i>Third Term</i>	<i>Hours</i>
AMDT 490	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
AMDT 417 [DIVR]	3
MKTG 360	3
AMDT Electives ²	3
Electives	6

<i>Second Term</i>	<i>Hours</i>
AMDT 413 [CAPS] [M]	3
AMDT 430	3
AMDT 450	3
300-400-level Electives	6

¹ For a total of 7 credits—one Biological Science [BSCI] and one Physical Science [PSCI] course,

including one lab course, or 8 credits of [SCI] designated courses. (SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI], which is offered Spring semester.)

² AMDT Electives include any AMDT course not used to fulfill major requirements.

³ Business Industry Elective: B LAW 210; ECONS 321, 326, 352, 430; MGMT 301, 315; MIS 250; PHIL 360; WOMEN ST 320 [M].

Description of Courses**APPAREL, MERCHANDISING, DESIGN & TEXTILES****AMDT**

105 Introductory College Seminar in Apparel, Merchandising, Design, and Textiles 1 Course Prerequisite: Concurrent enrollment in AMDT 108. Concepts of shared responsibility in planning and actual completion of AMDT undergraduate study.

108 Introduction to Apparel, Merchandising, Design and Textiles 3 An introduction to apparel, textiles, merchandising and design with an emphasis on an examination of industry structures and careers.

208 Visual Merchandising and Promotion 3 (2-2) Course Prerequisite: AMDT 108. Examination of fashion promotion components of visual display and store layout; application of principles and elements of design and concept development.

210 [SCI] Textiles 4 (3-3) Examination of basic textile components including fibers, yarns, structure, coloration, and finishes relative to performance standards and expectations for intended use.

211 Apparel Assembly 3 (0-6) Problem solving approach to apparel and textile product assembly with emphasis on product development process.

212 Apparel Product Development 3 Course Prerequisite: AMDT 210. Examination and evaluation of ready-to-wear apparel as it applies to the retail industry; explores concepts and principles of apparel production and terminology in the apparel industry.

220 Historic Costumes and Textiles 3 Global survey of dress and textiles from prehistory to mid-1800s.

221 (420) [M] Historic Costume II 3 Course Prerequisite: AMDT 210 or concurrent enrollment. Overview of apparel design, designers and social history in the 20th century.

250 Principles of Merchandising 3 Course Prerequisite: AMDT 108. Concepts and functions of merchandising in apparel and textiles industries; cost, pricing, and profit; marketing and retailing strategies.

307 Consumer Behavior in Fashion 3 Course Prerequisite: AMDT 314. Concepts and theories from social sciences to consumer behavior research related to fashion and apparel marketing.

- 310 Advanced Apparel Assembly 4** (1-6) Course Prerequisite: AMDT 211; certified in Apparel Design. Advanced assembly techniques for a range of textiles and multi-layer garments; emphasis of high-quality execution on final products.
- 311 Apparel Flat Patterning and Design 3** (0-6) Course Prerequisite: AMDT 211; certified major in Apparel Design. Flat pattern techniques for apparel patternmaking; development and creation of original design.
- 312 Apparel Draping, Fitting, and Design 3** (0-6) Course Prerequisite: AMDT 311; certified major in Apparel Design. Exploration of draping and flat pattern techniques; fitting techniques emphasized; development and creation of original design.
- 314 Fashion Forecasting 3** Course Prerequisite: AMDT 210; AMDT 221; AMDT 250; AMDT 368. Developing forecasting expertise needed to work in merchandising environment; examined through influences on acceptance and rejection of apparel/textile products; analysis of the forces such as socio-cultural indicators, past and present trends that influence existing trends, and the role of fashion forecasting theory and technique method in determining future trends in fashion and related industries.
- 315 [M] Textile Product Analysis 3** (2-2) Course Prerequisite: AMDT 210. Analysis of textile product characteristics including fiber, structure, finish, apparel product properties, garment performance, and overall quality assessment and assurance.
- 318 Merchandise Buying and Planning 3** (2-2) Course Prerequisite: AMDT 250; MATH [QUAN]; certified major in Apparel, Merchandising, and Textiles. In-depth study of apparel buying and planning, application of buying and planning principles, problem solving skill development.
- 368 Apparel Illustration and Rendering 3** (0-6) Illustration and rendering used for costume and fashion design. (Crosslisted course offered as AMDT 368, FINE ART 369).
- 408 [ARTS] Visual Analysis and Aesthetics 3** Course Prerequisite: Junior standing. In-depth analysis of the visual interaction among apparel, accessories and the body; identifying effective visual communication.
- 411 Advanced Apparel Design 3** (0-6) Course Prerequisite: AMDT 312; AMDT 492; senior standing; certified major in Apparel Design. Integrated application of apparel design, patternmaking principles with assembly processes to demonstrate capacity to develop and create high quality original designs.
- 412 Apparel Design Collection 3** (0-6) Course Prerequisite: AMDT 411; certified major in Apparel Design. Problem-solving creation and presentation of two and three-dimensional high quality original apparel and designs.
- 413 [CAPS] [M] Global Sourcing 3** Course Prerequisite: AMDT 307; AMDT 318; certified major in Apparel, Merchandising, and Textiles; junior standing. Knowledge, skills, and effective solutions for textile and apparel sourcing in a global context.
- 414 Creativity: Development of Consumer Products 3** Course Prerequisite: Junior standing; certified major in Apparel, Merchandising, and Textiles. Processes and techniques to stimulate creativity from a multidisciplinary approach for the development of new consumer products.
- 417 [DIVR] Multicultural Perspectives on the Body and Dress 3** Course Prerequisite: 6 credits [SSCI] UCORE; junior standing. Engagement in multidisciplinary approaches that explore the social importance of the body, gender and dress.
- 419 Regional Experience in Apparel/Textiles Field V 1-3** Course Prerequisite: Certified in any major. Field trips to experience the textile and apparel industry from the perspective of professionals within a wide range of careers. Additional cost associated with class. See department for details.
- 422 [DIVR] Fat Studies 3** Course Prerequisite: Junior standing. Examination of weight based oppression as a social justice issue with other systems of oppression based on gender, race, class, age, sexual orientation, and ability. (Crosslisted course offered as AMDT 422, WOMEN ST 422).
- 429 National Experience in Apparel/Textiles Field V 1-3** May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Certified major in Apparel, Merchandising, and Textiles. Field trip to experience national culture integrated with the field of textiles and apparel in industry centers in the US. Additional cost associated with class. See department for details.
- 430 Soft Goods Supply Chain Management 3** Course Prerequisite: AMDT 318; certified major in Apparel, Merchandising, and Textiles. Stages and functional areas of soft goods supply chain management.
- 439 International Experience in Apparel/Textiles Field V 1-3** May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Certified in any major. Field trip to experience international culture integrated with the field of textiles and apparel in industry centers worldwide. Additional cost associated with class. See department for details.
- 440 Organizational Leadership 3** (2-2) Application of organizational leadership principles using experiential learning models for skill transfer to industry.
- 450 Strategy Planning and Decision Making 3** Course Prerequisite: AMDT 307; AMDT 318; certified major in Apparel, Merchandising, and Textiles. Examination and synthesis of advanced merchandising theory; strategic planning, decision-making and the role of technology in the textile and apparel industry.
- 460 [M] Costume Museum Management 3** Course Prerequisite: Junior standing. Skills and techniques for handling textiles and apparel artifacts in museums.
- 488 Internship Preparation 1** May be repeated for credit; cumulative maximum 2 hours. Orientation and practical information for students in preparation for an internship.
- 490 Cooperative Education Internship V 1** (0-0) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: AMDT 488. Experience with business, industry or government unit.
- 492 Computer Applications in Apparel, Textile, and Design 3** (1-4) Course Prerequisite: AMDT 368; certified major in Apparel Design. Computer-aided design techniques in fashion graphics; portfolio development and presentation.
- 495 Instructional Practicum V 1-4** May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: By interview only.
- 496 Special Event Production V 1** (0-2) to 3 (0-6) May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: AMDT 208 or 211; certified major in Apparel, Merchandising, and Textiles; by permission of instructor. Producing, exhibiting, and promoting product lines/special events or apparel, textiles and illustrations exhibits.
- 498 Special Topics V 1-3** May be repeated for credit; cumulative maximum 6 hours. Current issues, trends, and merchandising strategies in apparel and textiles.
- 499 Special Problems V 1** (0-0) to 4 (0-12) May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 508 Environmental and Social Issues in the Apparel Industry 3** Exploration of current environmental and social issues in the global apparel industry.
- 512 Apparel Design Graduate Studio 3** Course Prerequisite: AMDT 508. Integration of consumer demand target market research with the development, application, and testing of prototype products for specific end uses.
- 515 Textile Product Development and Innovation 3** Apply knowledge of textile component and emerging materials/techniques to innovative textile product development. Recommended preparation: AMDT 210.
- 517 Theory and Methods of Culture, Gender and Dress 3** Exploration of appearance issues, theory, and research from the perspective of social science, feminist theory, postmodern and poststructural discourses.
- 518 Apparel Merchandising Analysis 3** Analysis of marketing and retailing strategies, trends and technological developments in relation to business and consumer aspects within a global context.
- 519 Research Methods 3** Analysis and understanding of research methods, exploration of thesis topic as applicable to the fields of apparel, merchandising, design and textiles.

- 520 Aesthetic Analysis of Fashion Design 3**
In-depth analysis of apparel fashion design provided through exploration of aesthetic and human perception theories within a socio-historic context.
- 596 Advanced Instructional Practicum 3**
Information and direction for graduate student teaching assistants seeking professional development in classroom teaching. S, F grading.
- 598 Topics in Apparel and Textiles V 1-3** May be repeated for credit; cumulative maximum 8 hours. Current topics in apparel and textile theory and research.
- 600 Special Projects or Independent Study V 1-18** May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination V 1-18** May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 702 Master's Special Problems, Directed Study and/or Examination V 1-18** May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

Asia Program

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Wilson 310
509-335-7425

Program Director and Clinical Associate Professor, L. Gerber (*History, China*); Professors, S. Ahn (*Finance and Management, International Business*), M. Myers (*Philosophy and Religion, South Asia, East Asia*), M. Tolmacheva (*History, Middle East*); Associate Professors, W. Brecher (*History, Japan*), N. Kawamura (*History, East Asia*), X. Liu (*Chinese*), P. Narayan (*English, South Asia*), R. Sun (*History, East Asia*), P. Thiers (*Political Science, East Asia*), X. Wang (*History, China*), C. Wilkinson-Weber (*Anthropology, South Asia*); Assistant Professors, J. Cassaniti (*Anthropology, Thailand Buddhism, Medical and Psychological Anthropology*), K. Inoue (*Japanese*), A. Wright (*History, British Empire in Asia*); Clinical Associate Professor, W. Cao (*Chinese*); Clinical Assistant Professors, R. Chan (*History, East Asia*), C. Weller (*History, Central Asia*); Instructors, S. Herzog (*History, British Empire, Southeast Asia, Slavery and Abolitionism*), K. Niimi (*Japanese*), L. Turner-Rahman (*History/Anthropology, South Asia*), R.

Snyder (*Philosophy, East Asia, South Asia*); Professors Emeriti, A. Spitzer (*Library*), P. Tansuhaj (*International Business, South East Asia*).

The WSU Asia Program promotes teaching, research, and outreach to prepare present and future leaders for the opportunities and challenges of Asia's increasing presence in global and regional affairs.

The WSU Asia Program offers a Bachelor of Arts in Asian Studies, a minor in Asian Studies, Certificate in East Asian Studies for College of Business Majors, and a Certificate in East Asian Studies for College of Engineering and Architecture Majors. The curriculum, leading to a B.A. in Asian Studies, promotes depth and breadth. The program provides students the opportunity to focus on one country or region (China, Japan, India, Middle East), while at the same time, requiring students to develop pan-Asian perspectives through geographic disciplinary distribution requirements.

The Asia Program is designed to provide a broad, systematic knowledge of Asia through interdisciplinary study and is intended to serve four major objectives:

- To prepare students intending to teach courses on Asia in public schools,
- To provide academic background for those planning to pursue graduate work on Asia,
- To prepare students for business careers dealing with Asia, and
- To train those interested in governmental and various private career opportunities related to Asia.

Upon completion of the Asia Program curriculum, graduates will be able to: 1) identify, locate, and critically evaluate resources for the study of Asia; 2) understand the commonalities, complexity, and diversity of Asia; 3) understand disciplinary approaches to the study of Asia; 4) identify problems and questions related to Asia and place in appropriate context; 5) understand traditions and transformations of Asian cultures; and 6) have competency in an Asian language equivalent to 2nd year level.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

ASIAN STUDIES (120 HOURS)

A minimum of 40 hours of courses on Asia, including 16 hours of an appropriate language and 18 hours at the 300 level or above, are required. 18 of the 40 credits of the Asia major must be earned at WSU.

First Year

First Term	Hours
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
ENGLISH 101 [WRITG]	3
Foreign Language Elective ²	4
Quantitative Reasoning [QUAN]	3 or 4

Second Term	Hours
Diversity [DIVR]	3
Foreign Language Elective ²	4

HISTORY 105 [ROOT]	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4

Second Year

First Term	Hours
ASIA 120, 121, 131, 275, or 315	3
ASIA 272, 273, 280, or 306	3
Foreign Language Elective ²	4
Humanities [HUM]	3
Electives	3

Second Term	Hours
Communication [COMM] or Written Communication [WRTG]	3
Creative & Professional Arts [ARTS]	3
Foreign Language Elective ²	4
Major Coursework ³	3
Social Sciences [SSCI]	3
Complete Writing Portfolio	

Third Year

First Term	Hours
ASIA 270 or 314 [M]	3
Major Coursework ³	3
300-400-level Electives	9

Second Term	Hours
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
Writing in the Major Course [M]	3
300-400-level Major Electives ⁴	9

Fourth Year

First Term	Hours
Integrative Capstone [CAPS]	3
Major Coursework ³	3
300-400-level Major Electives ⁴	9

Second Term	Hours
Major Coursework ³	3
300-400-level Electives	12

¹To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² 16 hours of college level study of a single Asian language (e.g., CHINESE/JAPANESE 101, 102, 203, 204). Languages not taught at WSU may be studied through distance learning programs, intensive summer courses, etc. For the second year of languages not taught at WSU, students may substitute 8 hours of any Asian study abroad credit. Although native speakers of an Asian language may be exempt from the language requirement and take 16 additional credit hours of ASIA courses, they are encouraged to complete a minimum of one year college level study of a different Asian language.

³ Disciplinary Distribution of Major Coursework: Asia Social Science courses (6 credits, minimum): ANTH 306, ASIA 301, HISTORY 270, 271, 272, or 275; Asia Humanities courses (6 credits, minimum): CHINESE 111, 120, 121, 131, FINE ART 302 [M], FOR LANG 130, 220, HISTORY 273, 370 373, 374, JAPANESE 120, PHIL 280, 314 [M], or 315 [M].

⁴ A minimum of 18 hours of 300-400-level ASIA courses and 6 hours of Writing in the Major [M] courses. Note: Courses may be used to satisfy requirements in more than one of the above categories. Students should consult their advisor to determine when courses are offered. Relevant 300-400-level courses not cross-listed with ASIA may be counted toward a major or minor if approved by the Director of the Asia Program. Study Abroad is very strongly encouraged. Geographic Distribution of Major Coursework (Optional): Students who complete a minimum of 9 hours on a specific region or country will receive a certificate of concentration within Asian Studies on that particular region or country (e.g. East Asia, South Asia, Middle East, China, Japan).

Minors

Asian Studies

A minor in Asian Studies requires 23 hours, including one year of a single Asian language or 8 hours of Asian study abroad credit. Of the 23 required credits, at least half must be upper division, and at least 9 credit hours must be earned at WSU. Native speakers of an Asian language are exempt from the language requirement for the minor (they instead take 8 additional credit hours of ASIA courses).

Certificates

Certificate in East Asian Studies for Business Majors

The Certificate in East Asian Studies for College of Business Majors requires a total of 17 credit hours and is open to any declared College of Business undergraduate major in good standing.

The requirements are: CHINESE 101 and 102 or JAPANESE 101 and 102 or other East Asia Language available through study abroad; one from ASIA 121, 275, 315, 373, 374, 475, 476, or 477; ASIA 479; and one from FIN 481, I BUS 380, 435, 453, 482, or ECONS 327/I BUS 470.

Students who complete two semesters of foreign language beyond the one-year requirement may waive three credits required from ASIA 121, 275, 315, 374, 475, or 477. Study abroad is encouraged and appropriate credit toward completion of certificate will be accepted at the discretion of the Asia Program Director. No more than 4 hours earned at other institutions that may apply towards the certificate and no more than 4 hours may be pass/fail. Native speakers of an East Asian language may waive the foreign language requirement, but must take eight additional hours from the list of "cultural survey" courses (see department for an approved list). A minimum cumulative GPA of 2.0 is required for successful completion of the certificate.

Certificate in East Asian Studies for Engineering and Architecture Majors

The Certificate in East Asian Studies for College of Engineering and Architecture Majors requires a total of 17 credit hours and is open to any declared College of Engineering and Architecture undergraduate major in good standing.

The requirements are: CHINESE 101 and 102 or JAPANESE 101 and 102 or other East Asia Language available through study abroad; two from ASIA 121, 275, 315, 373, 374, 475, 476, or 477; and ASIA 479.

Students who complete two semesters of foreign language beyond the one-year requirement may waive three credits required from ASIA 121, 275, 315, 374, 475, or 477. Study abroad is encouraged, and appropriate credit toward completion of certificate will be accepted at the discretion of the Asia Program Director. No more than 4 hours earned at other institutions that may apply towards the certificate and no more than 4 hours may be pass/fail. Native speakers of an East Asian language may waive the foreign language requirement, but must take eight additional hours of courses from the list of "cultural survey" courses (see department for an approved list). A minimum cumulative GPA of 2.0 is required for successful completion of the certificate.

Description of Courses

ASIA PROGRAM

ASIA

111 [DIVR] Asian Film 3 Asian film from a cultural perspective. Taught in English. (Crosslisted course offered as CHINESE 111, ASIA 111, JAPANESE 111). Cooperative: Open to UI degree-seeking students.

120 Traditional Chinese Culture 3 Cultural development of China from early times through the golden age of Chinese civilization. Taught in English. (Crosslisted course offered as CHINESE 120, ASIA 120, HUMANITY 120).

121 Modern Chinese Culture 3 An introduction to the culture of modern China, including Hong Kong and Taiwan. All readings in English. (Crosslisted course offered as CHINESE 121, ASIA 121). Cooperative: Open to UI degree-seeking students.

122 [DIVR] Traditional Japanese Culture 3 Traditional Japanese society and culture from ancient times to the 19th century. Taught in English. (Crosslisted course offered as JAPANESE 120, ASIA 122).

123 [HUM] Modern Japanese Culture 3 Issues, trends, and forms of popular culture that define modern and contemporary Japanese life. Taught in English. (Crosslisted course offered as JAPANESE 123, ASIA 123).

131 [DIVR] Masterpieces of Asian Literature 3 Introduction to Asian literature. Taught in English. (Crosslisted course offered as CHINESE 131, ASIA 131, HUMANITY 131, JAPANESE 131). Cooperative: Open to UI degree-seeking students.

201 Special Topics: Study Abroad V 1-15 May be repeated for credit. S, F grading.

220 [DIVR] Global Issues, Regional Realities 3 Introduction to the themes and concepts involved in global studies. Taught in English. (Crosslisted course offered as FOR LANG 220, ASIA 220).

270 [DIVR] India: History and Culture 3 Survey of South Asian history, societies and cultures - development of civilization and contemporary societies of India and South Asia. (Crosslisted course offered as HISTORY 270, ASIA 270).

271 [DIVR] Southeast Asian History: Vietnam to Indonesia 3 Historical introduction to Southeast Asian social, religious, political, economic and cultural institutions including Vietnam, Thailand, Burma, the Philippines and Indonesia. (Crosslisted course offered as HISTORY 271, ASIA 271).

272 [DIVR] Introduction to Middle Eastern History 3 History of the Middle East from Muhammad to the present; political and religious development and the impact of empires. (Crosslisted course offered as HISTORY 272, ASIA 272).

273 [DIVR] Foundations of Islamic Civilization 3 Islamic civilization presented through the main ideas, institutions and cultural forms; Golden Age of Islam and Muslim contributions to world civilizations. (Crosslisted course offered as HISTORY 273, ASIA 273).

275 [DIVR] Introduction to East Asian Culture 3 Survey of East Asia (China, Japan, Korea, and others) history from 1766 BCE to the present. (Crosslisted course offered as HISTORY 275, ASIA 275).

280 [HUM] Islam in Theory and Practice 3 Fundamental principles of Islam, including the relation between faith and practice, and the social, economic, political, and judicial systems in Islam. (Crosslisted course offered as PHIL 280, ASIA 280).

301 [DIVR] East Meets West 1 May be repeated for credit; cumulative maximum 3 hours. Analytical themes to explore historical and contemporary interactions between U.S. and Asia in cultural, political, and economic dimensions. Taught as a multicultural symposium.

302 [M] Arts of Asia 3 Art and architecture of India, China and Japan within their historical, religious and cultural contexts. (Crosslisted course offered as FINE ART 302, ASIA 302).

306 Cultures and Peoples of the Middle East 3 Contemporary Arab cultures in a historical perspective within the framework of Western-Middle Eastern relations. (Crosslisted course offered as ANTH 306, ASIA 306, HISTORY 306).

314 [HUM] [M] Philosophies and Religions of India 3 Metaphysical, epistemological, ethical, aesthetic, social, and political views of Hinduism, Buddhism, and Islam, and their influence on Indian civilization. (Crosslisted course offered as PHIL 314, ASIA 314).

315 [HUM] [M] Philosophies and Religions of China and Japan 3 The philosophies and religions of China and Japan, and their metaphysical, epistemological, ethical, social, and political positions and views of God and gods. (Crosslisted course offered as PHIL 315, ASIA 315).

- 320 [DIVR] [M] Issues in East Asian Ethics** 3 Philosophical foundations of ethical thought in East Asia; informed responses to modern ethical dilemmas. Taught in English. (Crosslisted course offered as JAPANESE 320, ASIA 320, CHINESE 320, HUMANITY 320). Cooperative: Open to UI degree-seeking students.
- 321 [M] Gender and Love in East Asian Culture** 3 The theme of gender with respect to love, courage, self-sacrifice, and vulnerability in traditional Chinese and Japanese literature and culture. (Crosslisted course offered as CHINESE 321, ASIA 321, JAPANESE 321).
- 322 [DIVR] Ecology in East Asian Cultures** 3 Major ecological issues in East Asia through cultural representations, and analysis of their implications to the U.S. (Crosslisted course offered as ASIA 322, CHINESE 322, HUMANITY 322, JAPANESE 322).
- 330 [M] The Art of War** 3 (2-2) The philosophy behind war, military strategy and its consequences and representation in literature and film from East Asia. Taught in English. (Crosslisted course offered as CHINESE 330, ASIA 330). Cooperative: Open to UI degree-seeking students.
- 370 History of Ancient and Medieval India** 3 Historical development to 1500 CE of states, religions, caste society, gender customs and social ecology in India. (Crosslisted course offered as HISTORY 370, ASIA 370).
- 373 [HUM] Chinese Civilization** 3 Growth of Chinese civilization from the Bronze Age to the present. (Crosslisted course offered as HISTORY 373, ASIA 373).
- 374 [HUM] Japanese Civilization** 3 Overview of Japanese history from the Stone Age to the present, including political, social, economic, and cultural history. (Crosslisted course offered as HISTORY 374, ASIA 374).
- 387 World War II in Asia and the Pacific** 3 Imperial rivalries in Asia; Japanese militarism; military, ideological and social aspects of the war; the atomic bomb; memory of the war. (Crosslisted course offered as HISTORY 387, ASIA 387).
- 472 [M] The Middle East Since World War I** 3 Course Prerequisite: Junior standing. Developments in the Middle East since World War I including nationalism, fundamentalism, and revolution. (Crosslisted course offered as HISTORY 472, ASIA 472).
- 473 The Middle East and the West** 3 Course Prerequisite: Junior standing. East-west tensions in the context of historical relations between the Middle East and West Europe since the rise of Islam. (Crosslisted course offered as HISTORY 473, ASIA 473).
- 474 [CAPS] Modern South Asia: Community and Conflict** 3 Course Prerequisite: Junior standing. Historical transformation of communities and communal conflicts in modern South Asia from 1500 to present; themes: caste, religion, geography, environment and economy. (Crosslisted course offered as HISTORY 474, ASIA 474).
- 475 Mao to Deng: The People's Republic of China, 1949 - Present** 3 The major political, social, economic and cultural developments during the People's Republic of China. (Crosslisted course offered as HISTORY 475, ASIA 475, POL S 475).
- 476 [M] Revolutionary China, 1800 to Present** 3 Continuity and change in the political, social, cultural and economic experience of China since 1800. (Crosslisted course offered as HISTORY 476, ASIA 476, POL S 476).
- 477 [DIVR] [M] Modern Japanese History** 3 Examination of political, socioeconomic and cultural changes and the international crises in modern Japan since the 19th century. (Crosslisted course offered as HISTORY 477, ASIA 477). Credit not granted for both HISTORY 477 and HISTORY 577.
- 479 History of East Asian Economic Development Since 1945** 3 The historical relationships between politics and economics in East Asian since 1945. (Crosslisted course offered as HISTORY 479, ASIA 479).
- 499 Special Problems** V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.

School of Biological Sciences

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Professor and Director, Larry Hufford; Professor and Associate Director of Graduate Program, Andrew Storfer; Professor and Associate Director of Undergraduate Program, Patrick Carter; Professors, K. Beerman, J. Bishop (Vancouver), S. Bollens (Vancouver), D. Evans, R. Gomulkiewicz, M. Knoblauch, S. McGuire, C. Portfors (Vancouver), E. Roalson, C. Robbins, H. Schwabl, M. Skinner, M. Tegeuder; Associate Professors, J. Busch, A. Cavagnetto, A. Cousins, M. Dybdahl, H. Hellmann, R. Lee, J. Mallatt, A. McCubbin, C. Schultz (Vancouver), E. Schwartz, P. Verrell; Assistant Professors, J. Brunner, W. Cooper (Tri-Cities), O. Cornejo, E. Crespi, J. Kelley, H. Kunz, J. Pioviah-Scott (Vancouver), S. Porter (Vancouver); Clinical Associate Professor, G. Rollwagen-Bollens (Vancouver); Clinical Assistant Professors, D. Allison, N. Ankras, L. Carloye, E. Johnson, K. McAteer (Tri-Cities), D. Monk, S. Ritchie, E. Sweet (Tri-Cities); Research, R. Giuliani, E. Nilsson, I. Sadler-Riggelman; Professors Emeriti, R. A. Black, G. Edwards, R. Johnson, K. Kardong, L. Kirschner, M. Ku, J. Larsen, R. Mack, D. Miller, D. Moffett, S. Moffett, C. Omoto, J. Paznokas, P. Schroeder, G. Thorgaard, E. Uribe.

The School of Biological Sciences offers training in molecular, cellular, organismal, ecological/environmental and evolutionary biology with an emphasis on plants and animals. The School offers Bachelor of Science degree programs in Biology and Zoology, and Master of Science and Doctor of

Philosophy programs in Biology and Plant Biology. The School also offers undergraduate minors in Zoology and Biology.

Facilities

There are modern facilities for study of molecular and genomics, cellular biology, genetics, plant and animal physiology, anatomy and ultrastructure, functional morphology, ecology, molecular systematics, behavior, ecology, and environmental and evolutionary biology. The University's location is conducive to field studies at sites such as the 800 acre George E. Hudson Biological Preserve at Smoot Hill and nearby public lands. Special facilities include the Franceschi Microscopy and Imaging Center, plant growth facilities, a laboratory for bioanalysis and biotechnology with facilities for genotyping, DNA sequencing, and genomics, a laboratory for stable isotope analyses, and the collections of the Charles R. Conner Museum of Natural History and the Marion Ownbey Herbarium.

Cooperation with many other campus units extends research opportunities. Cooperative arrangements with faculty in units such as Molecular Biosciences, Animal Sciences, Environment, and the College of Veterinary Medicine are readily achieved.

Undergraduate Programs

Introductory biological sciences courses provide background in the concepts common to life sciences and an overview of the diversity of animals, plants, and microorganisms. Advanced biological sciences courses probe specific areas in depth.

Undergraduate coursework in either biology or zoology prepares students to pursue career opportunities in ecology and environmental biology, laboratory research and biotechnology, human health, animal health and welfare, botany and plant sciences, entomology, education, and a variety of other biological specializations.

Candidates for the Bachelor of Science in Biology or the Bachelor of Science in Zoology must fulfill the University and the College of Arts and Sciences requirements for graduation as described elsewhere in this catalog. Honors students complete honors requirements in place of UCORE requirements. The math and science components of those requirements are fulfilled as part of the School requirements described below. Other University requirements include: 120 total credit hours of which 40 must be 300-400-level credits; the writing portfolio; and two writing in the major courses (identified by [M] in the course listings). College requirements include one year of foreign language or two years taken in high school. The Schedule of Studies below provides a sample curriculum for each of the degree options offered by the School of Biological Sciences. All Bachelor of Science degree options in Biology and Zoology require a minimum of 19 semester hours of core BIOLOGY courses (BIOLOGY 106, 107, 301, 372 and 405 or 403). An additional 21 semester hours of biological sciences coursework selected in consultation with your biology advisor is required. The 21 semester hours must include 15 upper division credits, six of which must be BIOLOGY courses taken in residence at WSU. An overall GPA of at least 2.0 must be maintained in all College and School requirements. A maximum of 4 credits of coursework that are graded S, F may be used toward fulfilling School requirements or program options, and no other courses taken S or P can be applied

toward fulfilling School requirements or program options. Students may not double major or take a minor in any combination of Biology, Zoology, General Studies Biological Sciences or General Studies Basic Medical Sciences.

We expect that students graduating with a Bachelor of Science in Biology or Zoology will have acquired: (1) mastery of fundamental biological concepts and an ability to integrate this conceptual knowledge across different subfields within the discipline; (2) ability to use critical thinking and scientific skills to analyze and solve biological problems; (3) skills to communicate effectively biological problems and solutions to the scientific community and the public at large in writing and oral discussion; (4) ability to formulate logical hypotheses, to test hypotheses using quantitative and other appropriate methods involving collection and analysis of data, and to make valid inferences from experimental results; (5) ability to identify and access the central body of knowledge in biology or zoology utilizing a wide range for methods to research the primary literature; (6) skill in using scientific literacy and knowledge of biology or zoology to analyze contemporary social, cultural, and environmental issues to make informed rational decisions.

Biology

Six options are available for the Bachelor of Science degree in Biology: general biology, biology education, botany, ecology/evolutionary biology, entomology, and pre-physical therapy/pre-occupational therapy/pre-physician assistant. The general biology option provides broad training in the life sciences, particularly for students seeking to continue in professional or graduate school. The biology education option is particularly suitable for students who would like to teach biology at the high school level. The botany option is available for students with a special interest in plants and serves students who would like careers in Plant sciences or to pursue graduate studies. The ecology/evolutionary biology option provides a concentration on ecological and evolutionary biology to address interests in such fields as environmental and wildlife biology. The entomology option is available for students who wish to focus on insect biology. The pre-physical therapy/pre-occupational therapy/pre-physician assistant option is designed for students who would like to pursue studies in physical therapy, occupational therapy, or physician assistant programs.

Zoology

Three options are available for the Bachelor of Science degree in Zoology: general zoology, pre-veterinary/animal care, and pre-medicine/pre-dentistry. Each of these options includes a core curriculum that provides a strong science foundation plus additional specialized courses taken in the particular program option. The flexible curriculum leading to a zoology degree meets the needs of students with various interests and goals. The general zoology option provides a broad, solid foundation in zoology. It is especially aimed at students desiring a well-rounded background for further professional studies or for entry into the work force in areas such as wildlife biology or fisheries. The pre-medicine/pre-dentistry option is offered by the School of Biological Sciences as a course program designed to provide a solid academic foundation that successfully prepares the student for admission

into medical, dental, or pharmacy school. The pre-veterinary/animal care option prepares students for careers involving animal care and maintenance in research institutions, zoos, aquaria, and clinics and for application to colleges of veterinary medicine.

Joint Program in Zoology and Veterinary Medicine

The School of Biological Sciences and the College of Veterinary Medicine have a combined program to allow highly qualified students to earn both a Bachelor of Science in Zoology and a Doctor of Veterinary Medicine degree within a seven-year program. Students will take a three-year zoology program, completing all UCORE requirements, the zoology core courses and pre-veterinary medicine requirements. This program includes mathematics; chemistry, including organic and biochemistry; general biology; physics; and the core zoology courses. Students will then enter the College of Veterinary Medicine and complete the requirements for total hours and 300-400-level hours before earning the BS in Zoology. Students will continue the curriculum, leading to the DVM degree after a total of seven years of college work.

Students will enter the university under normal procedures and must be advised in the School of Biological Sciences. Qualified students will be invited to apply for the program. High scholastic achievement and the promise of the same along with demonstrated experience and interest in working with animals will be the primary criteria for initial invitation. Selected students will be identified and invited to apply for the ZOO-DVM program after the second semester of the first year. Students would then declare zoology as a major in the first semester of the sophomore year and enter the joint program in that year. The procedures for acceptance into the DVM program will be the same as those for other applicants. Successful participants will complete the three-year zoology program and begin the veterinary medicine curriculum in their fourth year of study. Those students finishing all required classes would complete only the DVM curriculum from this point on. Most students will meet these requirements after one year of the DVM program. If the student is not accepted or withdraws from the ZOO-DVM program, the student could earn the BS in Zoology and/or apply to the College of Veterinary Medicine under normal procedures.

Transfer Students

Science courses taken at other institutions will be evaluated and credits accepted when possible. Inquiries should be directed to the Associate Director of Undergraduate Program.

Graduate Programs

At the graduate level, the school awards Master of Science and Doctor of Philosophy degrees in Biology and Plant Biology. Faculty interests and research programs are diverse, including genomics, molecular and cellular biology, animal and plant physiology, various aspects of organismal biology of plants and animals, systematics, ecology, evolutionary biology, and biology education. A list of specific faculty interests can be obtained at <http://sbs.wsu.edu/people/index.html> or by writing to the School. Communication with faculty members prior to applying for the graduate program is strongly encouraged.

Preparation for Graduate Study in Biology and Plant Biology

Students with undergraduate majors in such fields as animal sciences, biology, botany, cell biology, environmental sciences, genetics, microbiology, natural resources, plant sciences, wildlife biology, and zoology may be prepared for graduate study in the School of Biological Sciences. Graduate Record Examination scores from the general aptitude section are required.

Students who complete Master of Science and Doctor of Philosophy degrees in our program find careers as faculty in colleges and universities, conservation biologists and managers of natural resources, biologists and technicians for state and federal agencies, specialists in informatics, and scientists and laboratory technicians in biotechnology and other life sciences industries.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

BIOLOGY - BOTANY OPTION (120 HOURS)

First Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI]	4
CHEM 105 [PSCI] ¹	4
Creative & Professional Arts [ARTS]	3
HISTORY 105 [ROOT]	3

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 107	4
CHEM 106	4
ENGLISH 101 [WRTG]	3
MATH 140 [QUAN] or 171 [QUAN]	4

Second Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 301	4
CHEM 345	4
Humanities [HUM]	3
PHYSICS 101 or 201	4

<i>Second Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
Foreign Language and/or Electives	6
PHYSICS 102 or 202	4
Social Sciences [SSCI]	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 372 [M]	4
BIOLOGY 420	3
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
STAT 212, 412, or PSYCH 311	3 or 4

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 332 [M]	4
BIOLOGY 462	3
Diversity [DIVR]	3

Foreign Language or Electives 4
 Program Option Courses or Electives² 2 or 3

Fourth Year

First Term Hours
 BIOLOGY 403 or 405 3
 BIOLOGY 409 4
 Program Option Courses or Electives² 6
 Electives 3

Second Term Hours
 Integrative Capstone [CAPS] 3
 Program Option Courses or Electives² 12
 Complete School of Biological Sciences Exit Survey

¹ MATH 106 may be taken as a pre-/co-requisite to CHEM 105 and other MATH courses. MATH 108 may also be needed.

² Botany Program option courses should be selected in consultation with a biology advisor and include coursework to fulfill the University requirement of 40 upper division credits. All biology majors must complete 21 semester credits of biological coursework including 15 upper-division credits, 6 of which must be a BIOLOGY prefix taken in residence at WSU. Approved courses include 200-400-level BIOLOGY courses except those used to fulfill core requirements (BIOLOGY 106, 107, 301, 372, 403 or 405), and any courses approved by advisor. A maximum of 4 credits of coursework graded S/F may be used toward fulfilling departmental requirements or program options and must be approved by advisor.

BIOLOGY - ECOLOGY AND EVOLUTIONARY BIOLOGY OPTION (120 HOURS)

First Year

First Term Hours
 BIOLOGY 106 [BSCI] 4
 CHEM 105 [PSCI]¹ 4
 Creative & Professional Arts [ARTS] 3
 HISTORY 105 [ROOT] 3

Second Term Hours
 BIOLOGY 107 4
 CHEM 106 4
 ENGLISH 101 [WRTG] 3
 MATH 140 [QUAN] or 171 [QUAN] 4

Second Year

First Term Hours
 CHEM 345 4
 Communication [COMM] or Written Communication [WRTG] 3
 Humanities [HUM] 3
 PHYSICS 101 or 201 4

Second Term Hours
 BIOLOGY 301 4
 PHYSICS 102 or 202 4
 Program Option Courses or Electives²³ 4
 Social Sciences [SSCI] 3
 Complete Writing Portfolio

Third Year

First Term Hours
 BIOLOGY 372 [M] 4
 Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI] 3
 Program Option Courses or Electives²³ 7
 Foreign Language or Electives 3 or 4

Second Term Hours
 Diversity [DIVR] 3
 Program Option Courses or Electives²³ 6 or 7
 STAT 212, 412, or PSYCH 311 3 or 4
 Foreign Language or Electives 3 or 4

Fourth Year

First Term Hours
 BIOLOGY 403 or 405 3
 Program Option Courses or Electives²³ 11

Second Term Hours
 Integrative Capstone [CAPS] 3
 Program Option Courses or Electives²³ 13 or 14
 Complete School of Biological Sciences Exit Survey

¹ MATH 106 may be taken as a pre-/co-requisite to CHEM 105 and other MATH courses. MATH 108 may also be needed.

² Ecology and Evolutionary Biology Program option courses should be selected in consultation with a biology advisor and include coursework to fulfill the University requirement of 40 upper division credits. All biology majors must complete 21 semester credits of biological coursework including 15 upper-division credits, 6 of which must be a BIOLOGY prefix taken in residence at WSU. Approved courses include 200-400-level BIOLOGY courses except those used to fulfill core requirements (BIOLOGY 106, 107, 301, 372, 403 or 405), and any courses approved by advisor. A maximum of 4 credits of coursework graded S/F may be used toward fulfilling departmental requirements or program options and must be approved by advisor. Coursework must include a total of two BIOLOGY [M] courses.

³ 21 hours with a minimum of one course from each of the following four areas: physiology / biochemistry (BIOLOGY 350, 353, 420, BIOLOGY 352 or MBIOS 401, MBIOS 303), ecology (BIOLOGY 330, 410, 462, 469, 486), animal (BIOLOGY 321[M], 322[M], 324, 393[M], 412, 418 [M], 423, 428, 432 [M], 438 [M]), plant (BIOLOGY 322 [M], 393 [M], 409, 420). See advisor.

BIOLOGY - EDUCATION OPTION (137 HOURS)

First Year

First Term Hours
 BIOLOGY 106 [BSCI] 4
 CHEM 105 [PSCI]¹ 4
 Creative & Professional Arts [ARTS] 3
 HISTORY 105 [ROOT] 3

Second Term Hours
 BIOLOGY 107 4
 CHEM 106 4
 ENGLISH 101 [WRTG] 3
 MATH 140 [QUAN] or 171 [QUAN] 4

Second Year

First Term Hours
 CHEM 345 4
 Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI] 3
 Foreign Language or Electives² 3 or 4
 PHYSICS 101 or 201 4
 Social Sciences [SSCI] 3

Second Term Hours
 BIOLOGY 301 4
 ENGLISH 201 [WRTG], 298 [WRTG], 301 [WRTG], or 402 [M] [WRTG] 3
 PHYSICS 102 or 202 4
 TCH LRN 301 3
 TCH LRN 317³ 2
 Complete Writing Portfolio

Third Year

First Term Hours
 BIOLOGY 372 [M] 4
 Degree Program Electives⁴ 6
 Humanities [HUM] 3
 STAT 212, 412, or PSYCH 311 3 or 4

Second Term Hours
 Diversity [DIVR] 3
 MBIOS 401 3
 TCH LRN 464 3
 TCH LRN 465 3
 TCH LRN 466 2

Fourth Year

First Term Hours
 BIOLOGY 403 or 405 3
 BIOLOGY 430 3
 ED PSYCH 468 3
 MBIOS 303 4
 TCH LRN 467 [M] 3

Second Term Hours
 BIOLOGY 401 [CAPS] or 408 [CAPS] 3
 BIOLOGY 499 2 or 3
 Degree Program Elective⁴ 3
 TCH LRN 469 2
 TCH LRN 470 3
 Complete School of Biological Sciences Exit Survey

Fifth Year

First Term Hours
 TCH LRN 415 16

¹ MATH 106 may be taken as a pre-/co-requisite to CHEM 105 and other MATH courses. MATH 108 may also be needed.

² The College of Arts and Sciences requires two years of high school foreign language or two semesters of college-level foreign language.

³ A three-week intensive experience in a K-12 public or private school in the student's home community takes place mid-May through early June after the completion of WSU's spring semester.

⁴ All biology majors must complete 21 semester credits of biological coursework including 15 upper-division credits, 6 of which must be a BIOLOGY prefix taken in residence at WSU. Approved courses include 200-400-level BIOLOGY courses except

those used to fulfill core requirements (BIOLOGY 106, 107, 301, 372, 403 or 405), and any courses approved by advisor. A maximum of 4 credits of coursework graded S/F may be used toward fulfilling departmental requirements or program options and must be approved by advisor.

BIOLOGY - ENTOMOLOGY OPTION (120 HOURS)

First Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI]	4
CHEM 105 [PSCI] ¹	4
Communication [COMM] or Written Communication [WRTG]	3
HISTORY 105 [ROOT]	3

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 107	4
CHEM 106	4
ENGLISH 101 [WRTG] or 201 [WRTG]	3
MATH 140 [QUAN] or 171 [QUAN]	4

Second Year

<i>First Term</i>	<i>Hours</i>
CHEM 345	4
Creative & Professional Arts [ARTS]	3
Humanities [HUM]	3
PHYSICS 101 or 201	4

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 120, 332 [M], or 420	4
BIOLOGY 301	4
Diversity [DIVR]	3
PHYSICS 102 or 202	4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 352 or MBIOS 401	3
BIOLOGY 403 or 405	3
ENTOM 343 [M]	3
ENTOM 344 [M]	2
STAT 212, 412, or PSYCH 311	3 or 4

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 372 [M]	4
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
ENTOM 340 [M]	3
MBIOS 303	4
Social Sciences [SSCI]	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
Program Option Courses or Electives ²	12
Foreign Language or Electives	3 or 4

<i>Second Term</i>	<i>Hours</i>
Integrative Capstone [CAPS]	3
Foreign Language or Electives	3 or 4
Program Option Courses or Electives ²	10
Complete School of Biological Sciences Exit Survey	

¹ MATH 106 may be taken as a pre-/co-requisite to CHEM 105 and other MATH courses. MATH 108 may also be needed.

² Entomology Program option electives should be selected in consultation with a biology advisor and include coursework to fulfill the University requirement of 40 upper division credits. Courses must include 5 credits chosen from BIOLOGY 321 [M], 322 [M], 330, 350, 353, 393 [M] 409, 418 [M], 462; ENTOM 448; or MBIOS 446, or as approved by advisor and coursework to fulfill the University requirement of 40 upper division credits. All biology majors must complete 21 semester credits of biological coursework including 15 upper-division credits, 6 of which must be a BIOLOGY prefix taken in residence at WSU. Approved courses include 200-400-level BIOLOGY courses except those used to fulfill core requirements (BIOLOGY 106, 107, 301, 372, 403 or 405), and any courses approved by advisor. A maximum of 4 credits of coursework graded S/F may be used toward fulfilling departmental requirements or program options and must be approved by advisor.

BIOLOGY - GENERAL OPTION (120 HOURS)

First Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI]	4
CHEM 105 [PSCI] ¹	4
Creative & Professional Arts [ARTS]	3
HISTORY 105 [ROOT]	3

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 107	4
CHEM 106	4
ENGLISH 101 [WRTG]	3
MATH 140 [QUAN] or 171 [QUAN]	4

Second Year

<i>First Term</i>	<i>Hours</i>
CHEM 345	4
Communication [COMM] or Written Communication [WRTG]	3
Humanities [HUM]	3
PHYSICS 101 or 201	4

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 301	4
MBIOS 303	4
PHYSICS 102 or 202	4
Social Sciences [SSCI]	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 372 [M]	4
Diversity [DIVR]	3
Foreign Language or Electives	3 or 4
Program Option Courses or Electives ²	5 or 6

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
Foreign Language or Electives	3 or 4
Program Option Courses or Electives ²	6
STAT 212, 412, or PSYCH 311	3 or 4

Fourth Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 403 or 405	3
Program Option Courses or Electives ²	10

Electives	3
<i>Second Term</i>	<i>Hours</i>
BIOLOGY 352 or MBIOS 401	3
Integrative Capstone [CAPS]	3
Program Option Courses or Biology Electives ²	7
Program Option Courses or Electives ²	3
Complete School of Biological Sciences Exit Survey	

¹ MATH 106 may be taken as a pre-/co-requisite to CHEM 105 and other MATH courses. MATH 108 may also be needed.

² Biology General Program option courses should be selected in consultation with a biology advisor and include coursework to fulfill the University requirement of 40 upper division credits. All biology majors must complete 21 semester credits of biological coursework including 15 upper-division credits, 6 of which must be a BIOLOGY subject (prefix) taken in residence at WSU. Approved courses include 200-400-level BIOLOGY courses except those used to fulfill core requirements (BIOLOGY 106, 107, 301, 372, 403, or 405), and any courses approved by advisor. A maximum of 4 credits of coursework graded S/F may be used toward fulfilling departmental requirements or program options and must be approved by advisor. Coursework must include a total of two BIOLOGY [M] courses.

BIOLOGY - PRE-PHYSICAL THERAPY / PRE-OCCUPATIONAL THERAPY / PRE-PHYSICIAN ASSISTANT OPTION (120 HOURS)

First Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI]	4
CHEM 105 [PSCI] ¹	4
COMMUNICATIONS [COMM]	3
ENGLISH 101 [WRTG]	3

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 107	4
CHEM 106	4
HISTORY 105 [ROOT]	3
MATH 140 [QUAN] or 171 [QUAN]	4

Second Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 251 or 353	4
CHEM 345	4
Diversity [DIVR]	3
PSYCH 105 [SSCI]	3
SOC 101 [SSCI]	3

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 301	4
Creative & Professional Arts [ARTS]	3
Humanities [HUM]	3
PHYSICS 101 or 201	4
PSYCH 361	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 315	4
BIOLOGY 393 [M] or 490 [M]	2

Foreign Language, if needed	0 - 4
PHYSICS 102 or 202	4
STAT 212 or 412	3

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 220	2
BIOLOGY 372 [M]	4

Foreign Language, if needed, Program Option Courses, or Electives ²	3 or 4
H D 101	3
PSYCH 333	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
ENGLISH 402 [M]	3
KINES 380 or MBIOS 303	3 or 4
Program Option Courses or Electives ²	9

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 403 or 405	3
Integrative Capstone [CAPS]	3
Program Option Courses or Electives ²	8
Complete School of Biological Sciences Exit Survey	

¹ MATH 106 may be taken as a pre-/co-requisite to CHEM 105 and other MATH courses. MATH 108 may also be needed.

² Pre-Physical Therapy / Pre-Occupational Therapy / Pre-Physician Assistant Program option courses should be selected in consultation with a biology advisor and include coursework to fulfill the University requirement of 40 upper division credits. All biology majors must complete 21 semester credits of biological coursework including 15 upper-division credits, 6 of which must be a BIOLOGY prefix taken in residence at WSU. A minimum of 4 credits selected from the following courses is recommended: ANTH 203, 260, 380, 405; BIOLOGY 333, 352, 407, 495, 497; KINES 462; MBIOS 304, 305, 423, 440; NEUROSCI 301, 302; PHIL 365. Other approved courses include 200-400-level BIOLOGY courses except those used to fulfill core requirements (BIOLOGY 106, 107, 301, 372, 403 or 405), and any courses approved by advisor. A maximum of 4 credits of coursework graded S/F may be used toward fulfilling departmental requirements or program options and must be approved by advisor.

ZOOLOGY - GENERAL OPTION (120 HOURS)

First Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI]	4
CHEM 105 [PSCI] ¹	4
Creative & Professional Arts [ARTS]	3
HISTORY 105 [ROOT]	3

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 107	4
CHEM 106	4
ENGLISH 101 [WRTG]	3
MATH 140 [QUAN] or 171 [QUAN]	4

Second Year

<i>First Term</i>	<i>Hours</i>
CHEM 345	4

Communication [COMM] or Written Communication [WRTG]	3
Humanities [HUM]	3
Program Option Courses, Foreign Language, and/or Electives ²	7

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 301	4
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
Diversity [DIVR]	3

Program Option Courses, Foreign Language, and/or Electives ²	3 - 6
STAT 212, 412, or PSYCH 311	3 or 4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 321 [M], 322 [M], or 324	4
PHYSICS 101 or 201	4
Program Option Course or Electives ²	6 or 7
Social Sciences [SSCI]	3

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 321 [M], 322 [M], or 324	4
BIOLOGY 372 [M]	4
PHYSICS 102 or 202	4
Electives	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 350 or 353	4
BIOLOGY 403 or 405	3
Program Option Courses or Electives ²	6

<i>Second Term</i>	<i>Hours</i>
Integrative Capstone [CAPS]	3
Program Option Courses or Electives ²	10
Complete School of Biological Sciences Exit Survey	

¹ MATH 106 may be taken as a pre-/co-requisite to CHEM 105 and other MATH courses. MATH 108 may also be needed.

² Zoology General Program Option electives should be selected in consultation with a biology advisor and must include 9 credits selected from ANIM SCI 314; BIOLOGY 352, 393 [M], 407, 410, 412, 418 [M], 423, 428, 432, 438 [M], 469, 486, 495; ENTOM 340, 343 [M], 344 [M], 448; MBIOS 303, or as approved by advisor. All zoology majors must complete 21 semester credits of biological coursework including 15 upper-division credits, 6 of which must be a BIOLOGY prefix taken in residence at WSU. Approved courses include 200-400-level BIOLOGY courses except those used to fulfill core requirements (BIOLOGY 106, 107, 301, 372, 403, and 405), and any courses approved by advisor. A maximum of 4 credits of coursework graded S/F may be used toward fulfilling departmental requirements or program options and must be approved by advisor.

ZOOLOGY - PRE-MEDICINE/PRE-DENTISTRY OPTION (120 HOURS)

First Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI]	4

CHEM 105 [PSCI] ¹	4
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 107	4
CHEM 106	4
HISTORY 105 [ROOT]	3
MATH 140 [QUAN] or 171 [QUAN]	4

Second Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 301	4
CHEM 345	4
PHYSICS 101 or 201	4
Social Sciences [SSCI]	3

<i>Second Term</i>	<i>Hours</i>
CHEM 348	4
Communication [COMM] or Written Communication [WRTG]	3
Diversity [DIVR]	3
PHYSICS 102 or 202	4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 315, 321 [M], or 324	4
BIOLOGY 322 [M], 418 [M], or MBIOS 305	4 or 3
BIOLOGY 403 or 405	3
Humanities [HUM]	3
Program Option Courses, Foreign Language, or Electives ²	3 or 4

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 372 [M]	4
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
Foreign Language or Electives	2 - 4
MBIOS 303	4
Program Option Courses or Electives ²	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 322 [M], 418 [M], or MBIOS 305	3 or 4
BIOLOGY 352	3
Program Option Courses or Electives ²	9

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 315, 321 [M], or 324	4
BIOLOGY 353	4
Integrative Capstone [CAPS]	3
STAT 212, 412, or PSYCH 311	3 or 4
Complete School of Biological Sciences Exit Survey	

¹ MATH 106 may be taken as a pre-/co-requisite to CHEM 105 and other MATH courses. MATH 108 may also be needed.

² Zoology, Pre-Medicine/Pre-Dentistry Option, must include 21 semester credits of biological coursework including 15 upper-division credits, 6 of which must be a BIOLOGY prefix taken in residence at WSU. Approved courses include 200-400-level BIOLOGY courses except those used to fulfill core requirements (BIOLOGY 106, 107, 301, 372, 403, and 405), and any courses approved by advisor. A maximum of 4 credits of coursework graded S/F may be used toward fulfilling departmental requirements or program options and must be approved by advisor.

ZOOLOGY - PRE-VETERINARY/ANIMAL CARE OPTION (120 HOURS)

First Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI]	4
CHEM 105 [PSCI] ¹	4
Creative & Professional Arts [ARTS]	3
HISTORY 105 [ROOT]	3

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 107	4
CHEM 106	4
ENGLISH 101 [WRTG]	3
MATH 140 [QUAN] or 171 [QUAN] ¹	4

Second Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 301	4
CHEM 345	4
Communication [COMM] or Written Communication [WRTG]	3
Humanities [HUM]	3
Social Sciences [SSCI]	3

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
MBIOS 303 or Elective ²	4
PHYSICS 101 or 201	4
Program Option Courses, Foreign Language, or Electives ³	3
STAT 212 or 412	3 or 4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 321 [M], 322 [M], or 324	4
PHYSICS 102 or 202	4
Program Option Courses, Foreign Language, or Electives ³	6

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 321 [M], 322 [M], or 324	4
BIOLOGY 372 [M]	4
Diversity [DIVR]	3
Electives	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 350 or 353	4
BIOLOGY 403 or 405	3
Program Option Courses or Electives ³	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
Integrative Capstone [CAPS]	3
Program Option Courses or Electives ³	10
Electives	3
Complete School of Biological Sciences Exit Survey	

¹ MATH 106 may be taken as a pre-/co-requisite to CHEM 105 and other MATH courses. MATH 108 may also be needed.

² A biochemistry course is required for admittance to U.S. veterinary colleges.

³ Zoology, Pre-Veterinary/Animal Care Program

Option electives should be selected in consultation with a biology advisor and must include 12 credits selected from BIOLOGY 352, 360, 393 [M], 412, 423, 428, 432, 438 [M], 495, MBIOS 303, 304, 305, NATRS 431, or as approved by advisor. Beyond the core requirements (BIOLOGY 106, 107, 301, 372, and 403 or 405) all zoology majors must complete 21 semester credits of biological coursework including 15 upper-division credits, 6 of which must be a BIOLOGY prefix taken in residence at WSU. Approved courses include 200-400-level BIOLOGY courses not used to fulfill core requirements, and any courses approved by advisor. A maximum of 4 credits of coursework graded S/F may be used toward fulfilling departmental requirements or program options and must be approved by advisor.

Minors

Biology

A minor in biology requires a minimum of 20 hours in BIOLOGY coursework including BIOLOGY 106, 107, 301 and 8 additional hours of BIOLOGY courses at the 300-level or above. No more than 2 hours in BIOLOGY 490, 491, 494, 495, 496, 497 or 499 may be included in the 20 hours. 9 credit hours must be earned in residence at WSU or through WSU-approved education abroad or educational exchange courses. All coursework for the minor must have a minimum cumulative GPA of 2.0. Students who major in biology or zoology cannot be granted a minor in biology.

Zoology

A minor in zoology requires a minimum of 20 hours, including BIOLOGY 106, 107, and one of 321, 322, or 324; and 8 additional hours from the following courses: BIOLOGY 315, 330, 333, 335, 350, 352, 353, 354, 407, 410, 412, 418, 423, 428, 432, 438, 456, 475, 476, 486, 490, 491, 495, 496, 497, 499. No more than 2 hours of BIOLOGY 490, 491, 495, 496, 497, or 499 may be included in the 20 hours. Credit hours for the minor must include 9 hours of 300-400-level courses taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. All coursework for the minor must have a minimum cumulative GPA of 2.0.

Certificates

Certificate in Quantitative Biology

The certificate in quantitative biology requires 28 credit hours including MATH/BIOLOGY 340 and MATH/BIOLOGY 494. In addition to the two required courses, students must take at least 12 hours of courses in mathematics, statistics, or computer science of which at least 8 hours must be at the 300-level or above and at least 12 hours of life sciences courses of which at least 8 hours must be at the 300-level or above. A list of recommended courses is provided in the departments. The requirement for 300-level or above may include independent research credits. However, no more than 4 hours of S, F graded coursework (including MATH/BIOLOGY

494 and 499) may count towards the 28 credits. No more than 7 out of the 28 credits may be transfer credits. Students must earn a cumulative GPA of 2.5 and no less than a C for graded courses used to fulfill the requirements of the certificate. A faculty coordinator shall be designated to oversee the certificate approval process.

Description of Courses

BIOLOGY

BIOLOGY

101 [BSCI] Biology of Humans 3 The biology of good health and longevity; evaluation of lifestyle choices; consideration of each body system and the potential for disease and disorder. Credit not granted towards elective requirements for majors in the School of Biological Sciences.

102 [BSCI] General Biology 4 (3-3) Enrollment not allowed if credit for BIOLOGY 105 already earned. Understanding current and future advances in biology as 'citizen scientists'. Lecture and laboratory; not for students majoring in the life sciences. Credit not allowed for students who have already completed BIOLOGY 105. Credit not granted towards elective requirements for majors in the School of Biological Sciences.

103 [BSCI] Science and Scientific Thinking 1 (0-3) Exploring science as a tool for understanding nature using case studies, experimentation, and data analysis. Topics range from atoms to ecosystems including physiology, inheritance, and the carbon cycle. Credit not granted towards elective requirements for majors in the School of Biological Sciences. Recommended for students with an ALEKS math placement score of less than 45%.

105 General Biology Laboratory 1 (0-3) Course Prerequisite: Junior standing. Enrollment not allowed if credit for BIOLOGY 102 already earned. Understanding biology as a science and its effect on issues within society. Laboratory only. Credit not allowed for students who have already completed BIOLOGY 102. Credit not granted towards elective requirements for majors in the School of Biological Sciences.

106 [BSCI] Introductory Biology: Organismal Biology 4 (3-3) Course Prerequisite: One of the following -- a minimum ALEKS math placement score of 40%, MATH 100 with an S, MATH 101 with a C or better, MATH 103 or higher, BIOLOGY 103 with a C or better, BIOLOGY 102, BIOLOGY 120, or 3 credits of biology with a lab. One semester of a two semester sequence (BIOLOGY 106/107 or BIOLOGY 107/106) for science majors and pre-professional students. Biology of organisms; plants, animals, ecology and evolution.

- 107 [BSCI] Introductory Biology: Cell Biology and Genetics** 4 (3-3) Course Prerequisite: Minimum 2 credits 100 level CHEM or concurrent enrollment. First or second semester of a one-year sequence (BIOLOGY 106/107 or BIOLOGY 107/106) for science majors and pre-professional students. Cell biology and genetics of prokaryotes and eukaryotes.
- 110 [BSCI] Biological Perspectives on Environmental Issues** 3 Current case studies of human interaction with the environment exploring concepts in ecology, biodiversity, global chemical cycles, and climate change. Credit not granted towards elective requirements for majors in the School of Biological Sciences.
- 111 [BSCI] Laboratory Experiments in Biology and Genetics** 1 (0-3) Scientific method and its application to a diverse range of biology and genetics topics and research questions. Credit not granted towards elective requirements for majors in the School of Biological Sciences.
- 120 [BSCI] Introductory Botany** 4 (3-3) Introduction to plant science, highlighting certain aspects of plant biology and current research and how these relate to us all in the modern world. Credit not granted towards elective requirements for majors in the School of Biological Sciences.
- 125 [BSCI] Genetics and Society** 3 Genetic topics in media and daily life including human health, agriculture, ecology and forensics for the educated non-biologist. Credit not granted towards elective requirements for majors in the School of Biological Sciences.
- 135 [BSCI] Animal Natural History** 3 Identification, life history, habitat relations, ecology, behavior, and conservation of animals commonly found in the Pacific Northwest. Credit not granted towards elective requirements for majors in the School of Biological Sciences.
- 140 [BSCI] Introduction to Nutritional Science** 3 Information related to dietary sources of nutrients, their functions in the body, physiologic and environmental factors that govern nutrient requirements, and guidelines for optimal dietary patterns. Credit not granted towards elective requirements for majors in the School of Biological Sciences.
- 150 [BSCI] Evolution** 3 Basic principles and implications of Darwinian evolution. Credit not granted towards elective requirements for majors in the School of Biological Sciences.
- 201 Contemporary Biology** 1 Course Prerequisite: BIOLOGY 101, 102, 106, 107, 120, or MBIOS 101. Biological information that provides a framework for understanding life processes; impact of biological information on human affairs.
- 210 Your Future in Life Sciences** 2 Exploration of career options in biological sciences with faculty and outside speakers; guide to preparing resume and career plans. (Crosslisted course offered as SCIENCE 210, BIOLOGY 210, MBIOS 210). S, F grading.
- 220 Medical Terminology** 2 Course Prerequisite: BIOLOGY 101, 102, 106, 107, or KINES 262. Terms and word constructions for health care occupations; format and function of medical records.
- 221 Exploring Health Careers** 2 Introduction to human and animal health care careers. S, F grading.
- 225 Preparation for the Health Care Workplace** 2 (1-3) Basic content and skills to prepare for health related internships.
- 251 Introductory Human Physiology** 4 (3-3) Course Prerequisite: BIOLOGY 102, 106, or 107. Basic physiological processes in humans from the cellular to the organismal level. Credit not granted for both BIOLOGY 251 and 353.
- 298 [BSCI] Honors Biology for Non-Science Majors** 4 (3-3) Course Prerequisite: Must be an Honors student. Understanding the natural world from a biological perspective for non-science majors.
- 301 General Genetics** 4 Course Prerequisite: BIOLOGY 106 or 120; BIOLOGY 107; CHEM 101 or 105; CHEM 102 or 106. Principles of modern and classical genetics. (Crosslisted course offered as MBIOS 301, BIOLOGY 301).
- 308 [BSCI] Marine Biology** 3 Course Prerequisite: BIOLOGY 106; sophomore standing. Introduction to the marine environment including oceanic, near-shore and estuarine communities of organisms and their roles and interactions.
- 315 Gross and Microanatomy** 4 (3-3) Course Prerequisite: At least 3 hours of BIOLOGY; sophomore standing; cumulative WSU GPA 2.5 or better. Gross and microscopic anatomy of the human body. Recommended for pre-health care professionals only.
- 321 [M] Principles of Animal Development** 4 (3-3) Course Prerequisite: BIOLOGY 106; BIOLOGY 107. Experimental analyses of development and descriptive and comparative examination of embryology; emphasis on the chordates. Recommended preparation: BIOLOGY 301 or MBIOS 301.
- 322 [M] Invertebrate Biology** 4 (3-3) Course Prerequisite: BIOLOGY 106. Phylogenetic relationships, development, and functional ecology of the invertebrate animals.
- 324 Comparative Vertebrate Anatomy** 4 (2-6) Course Prerequisite: BIOLOGY 106. Evolution of vertebrates and their organ systems; correlation of structural modification with function. Cooperative: Open to UI degree-seeking students.
- 330 Principles of Conservation** 3 Course Prerequisite: BIOLOGY 102, 106, or 107. Conservation of major natural resources through a biological approach; philosophical, economic, and political aspects of important conservation issues.
- 332 [M] Systematic Botany** 4 (3-3) Course Prerequisite: BIOLOGY 106 or 120. Identification and classification of vascular plants with emphasis on the local flora.
- 333 [BSCI] Human Nutrition and Health** 3 Course Prerequisite: BIOLOGY 102, 106, 107, 251, 315, or concurrent enrollment in Biology 251. Credit not granted for students who have already completed BIOLOGY 233 with a grade of C or above. Foundations in nutritional science and its relationship to human health through the application of fundamental principles of biology.
- 335 [M] Genome Biology** 3 Course Prerequisite: BIOLOGY 301. Comparative analysis of genomes from bacteria to humans including methods for sequencing, genotyping, annotation of genomes, population genetics and evolution.
- 340 Introduction to Mathematical Biology** 3 Course Prerequisite: MATH 140 with a C or better, or MATH 172 with a C or better, or MATH 182 with a C or better; BIOLOGY 101, BIOLOGY 102, BIOLOGY 106, or BIOLOGY 107. Mathematical biology and development of mathematical modeling for solutions to problems in the life sciences. (Crosslisted course offered as MATH 340, BIOLOGY 340).
- 350 Comparative Physiology** 4 (3-3) Course Prerequisite: BIOLOGY 107; CHEM 345. Analysis of systems and integrative physiology with an emphasis on evolutionary adaptation among mammalian and non-mammalian vertebrates.
- 352 Cell Physiology** 3 Course Prerequisite: BIOLOGY 107; CHEM 345. Function and control at the cell-tissue level.
- 353 Advanced Human Physiology** 4 (3-3) Course Prerequisite: BIOLOGY 106; BIOLOGY 107. Function and control at the organ-organismic level with emphasis on mammals, including humans; emphasis on human health science applications. Credit not granted for both BIOLOGY 251 and 353. Recommended preparation: BIOLOGY 315 or 354.
- 354 Human Anatomy for Health Occupations** 4 (3-3) Course Prerequisite: BIOLOGY 107; CHEM 102 or 345. History and anatomy of humans with non-cadaver-based laboratory utilizing preserved and histological specimens, models and software.
- 360 Molecular Processes of Living Organisms** 3 Course Prerequisite: BIOLOGY 107. Exploration of fundamental molecular processes to encourage thinking beyond biological species in order to comprehend larger-scale biological issues and relevance for society.
- 372 [M] General Ecology** 4 (3-3) Course Prerequisite: BIOLOGY 106; CHEM 102 or 105. Relationship of organisms with physical and biotic components of their environment at the population, community, and ecosystem level. Field trips may be required.
- 390 Stream Monitoring** 1 (0-3) Course Prerequisite: BIOLOGY 101, 102, or 106; CHEM 101 or 105; junior standing. Principles and methods of water quality monitoring, including habitat assessment, water chemistry, and biological assessment. Field work and independent research required.

- 393 [M] Professional Communications in Biology** 2 Course Prerequisite: Certified major in Biology or Zoology or General Biological Sciences or General Studies Basic Medical Sciences. Literature investigation, oral presentation and written reports of selected topics in biology.
- 394 Medicine as a Career** 1 Course Prerequisite: Junior standing. Current issues in medicine; ethical, financial, and personal aspects of medical practice. S, F grading.
- 401 [CAPS] Plants and People** 3 Course Prerequisite: Biol 102, 106, or 120; junior standing. Relationships between plants and people, especially cultural and economic applications of plants.
- 403 Evolutionary Biology** 3 Course Prerequisite: BIOLOGY 301. The survey of evidence for evolution and operation of evolutionary processes that influence adaptation, diversification and speciation in organisms.
- 405 Principles of Organic Evolution** 3 (2-3) Course Prerequisite: BIOLOGY 301. The evolutionary processes that influence adaptation, population differentiation, and speciation in organisms.
- 407 [BSCI] Biology of Women** 3 Course Prerequisite: BIOLOGY 102 or 106; junior standing. Biological basis of sex and its relationship to body function, women and health care, and the impact of social and cultural perspectives on the experience of being female. (Crosslisted course offered as BIOLOGY 407, WOMEN ST 407).
- 408 [CAPS] Contemporary Genetics** 3 Course Prerequisite: MBIOS / BIOLOGY 301 with a C or better; junior standing. Consideration of the state-of-the-art genetic technologies and their impact on society, environment and the economy.
- 409 Plant Anatomy** 4 (2-6) Course Prerequisite: BIOLOGY 106 or 120. Developmental anatomy and morphology of vascular plants; economic forms. Credit not granted for both BIOLOGY 409 and BIOLOGY 509.
- 410 Marine Ecology** 3 Course Prerequisite: BIOLOGY 106. The ecology and conservation of marine organisms, communities, and ecosystems.
- 412 Biology of Fishes** 3 (2-3) Course Prerequisite: BIOLOGY 106. Evolution, identification, life history, and characteristics of important fish species.
- 418 Parasitology** 4 (3-3) Course Prerequisite: BIOLOGY 102 or BIOLOGY 106; junior standing. Types of associations, life cycles, control, prevention, and modifications of parasites; examination of parasitic protozoa and helminths.
- 420 Plant Physiology** 3 Course Prerequisite: BIOLOGY 106 or 120. Water relations, mineral nutrition, photosynthesis, respiration, and growth of plants. Recommended: Organic chemistry.
- 421 Plant Physiology Laboratory** 1 (0-3) Course Prerequisite: BIOLOGY 420 or concurrent enrollment. Laboratory for Biol 420.
- 423 Ornithology** 4 (3-3) Course Prerequisite: BIOLOGY 106. Ecology, systematics, and evolution of birds. Field trips required include two Saturdays.
- 428 Mammalogy** 4 (3-3) Course Prerequisite: BIOLOGY 106. Ecology, systematics, and evolution of mammals.
- 430 Methods of Teaching Science** 3 Course Prerequisite: Junior standing. Methods, philosophy, and structure of science; application in teaching middle and secondary school science courses. (Crosslisted course offered as BIOLOGY 430, SCIENCE 430).
- 432 [M] Biology of Amphibians and Reptiles** 4 (3-3) Course Prerequisite: BIOLOGY 106; BIOLOGY 372 or NATRS 300. Characteristics, evolution, and systematics; patterns of distribution; adaptive strategies; interactions between humans and amphibians and reptiles.
- 438 [M] Animal Behavior** 3 (2-3) Course Prerequisite: BIOLOGY 106. Biological study of animal behavior as viewed from ethological, genetic, developmental, ecological, and evolutionary perspectives.
- 456 Neuroethology** 3 Course Prerequisite: BIOLOGY 301, MBIOS 303, or 300-level NEUROSCI course; STAT 412 or concurrent enrollment. Introduction to neural mechanisms underlying natural animal behaviors from the cellular level to the organismal level.
- 462 Community Ecology** 3 Course Prerequisite: BIOLOGY 372 with a C or better. Assembly, essential properties, levels of interactions, succession, and stability of natural communities; emphasizes an experimental approach to community investigation. Credit not granted for both BIOLOGY 462 and BIOLOGY 562. Recommended preparation: BIOLOGY 372.
- 465 Field Stream Ecology** 2 Course Prerequisite: BIOLOGY 372. Ecological roles of immature insects in different size streams; pattern changes along the stream continuum; other ecological characteristics.
- 469 Ecosystem Ecology and Global Change** 3 Historic and current factors controlling the function of ecosystems and their responses to natural and human caused global change. (Crosslisted course offered as BIOLOGY 469, ENVR SCI 469, BIOLOGY 569, ENVR SCI 569). Credit not granted for both BIOLOGY 469 and 569, or ENVR SCI 469 and 569. Cooperative: Open to UI degree-seeking students.
- 470 Diversity of Plants** 3 Morphological, life history, and ecological diversity of major plant clades; emphasis on principles of homology, character transformation, and macroevolution.
- 473 [CAPS] [M] Evolution and Society** 3 Course Prerequisite: ANTH 260 or BIOLOGY 301; junior standing. Survey of how evolutionary theory is used to better understand ourselves and the societies in which we exist and interact with others. (Crosslisted course offered as BIOLOGY 473, ANTH 473).
- 474 Computational Biology** 4 (3-3) Course Prerequisite: BIOLOGY 301; MATH 140 or 171; STAT 212, 412, or PSYCH 311. Theory and current literature on a wide range of computational techniques used to address and solve problems in biology; a practical introduction to R/python as scientific languages useful in the solution of problems in biology.
- 475 Systems Biology of Reproduction** 3 Current literature based course on systems biology with a molecular/epigenetic to physiological level understanding of cell, development, disease, and evolutionary biology. Credit not granted for both BIOLOGY 475 and 575.
- 476 Epigenetics and Systems Biology** 3 Course Prerequisite: BIOLOGY 301. Current literature based course on epigenetics and systems biology with topics in environmental epigenetics, disease etiology, and role epigenetics in evolutionary biology. Credit not granted for both BIOLOGY 476 and 576.
- 480 [M] Writing in Biology** 2 Course Prerequisite: Certified major in Biology or Zoology or General Biological Sciences or General Studies Basic Medical Sciences. Discussion and practice in relating thinking and writing; popular and professional communication in biology.
- 483 [CAPS] [M] Organisms and Global Change** 3 Course Prerequisite: BIOLOGY 372; junior standing. Interaction between organisms and global change across scales of biology.
- 485 [CAPS] Biology of the Oceans** 3 Course Prerequisite: BIOLOGY 322 or 410; certified major in Biology or Zoology; junior standing. Interdisciplinary capstone course that explores the ocean world from molecules to ecosystems in the context of scientific discovery and society.
- 486 [M] Marine Invertebrate Communities** 3 (2-3) Course Prerequisite: BIOLOGY 106. Survey of marine invertebrates and their habitats. One-week field/lab course at a marine station.
- 490 [M] Professional Seminar in Physical Therapy** 2 Course Prerequisite: By permission only. Consideration of treatment modalities and health issues in physical therapy and related disciplines. A, S, F grading.
- 491 Clinical Experience** V 1-4 May be repeated for credit; cumulative maximum 20 hours. Course Prerequisite: PSYCH 105; BIOLOGY 315; junior standing; by permission only. Work experience under supervision of a qualified professional in a clinical setting. S, F grading.
- 492 Topics in Biology** V 1-3 May be repeated for credit; cumulative maximum 6 hours.

- 494 Seminar in Mathematical Biology** 1 May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: MATH 140 with a C or better, or MATH 172 with a C or better, or MATH 182 with a C or better; BIOLOGY 101, BIOLOGY 102, BIOLOGY 106, or BIOLOGY 107. Oral presentation of research approaches, research results and literature review of mathematical biology including mathematical modeling of biological systems. (Crosslisted course offered as MATH 494, BIOLOGY 494). Cooperative: Open to UI degree-seeking students. S, F grading.
- 495 Internship in Biology, Botany, and Zoology** V 1-4 May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: By permission only. Experience in work related to specific career interests. S, F grading.
- 496 [M] Special Problems and Reports** V 1-4 Course Prerequisite: By permission only. Independent project with written project proposal, progress report, and final report required. S, F grading.
- 497 Instructional Practicum** V 1-4 May be repeated for credit; cumulative maximum 8 hours. Academic traineeship in laboratory teaching and tutoring.
- 499 Special Problems** V 1-4 May be repeated for credit. Course Prerequisite: By permission only. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 500 Seminar** 1 May be repeated for credit. S, F grading.
- 501 Proposal Defense Seminar** 2 Research proposal defense as part of the preliminary examination for candidacy in the Ph.D. program. S, F grading.
- 504 Experimental Methods in Plant Physiology** 3 (2-3) Advanced techniques and instrumental methods applicable to research in plant physiology.
- 509 Plant Anatomy** 4 (2-6) Developmental anatomy and morphology of vascular plants; economic forms. Credit not granted for both BIOLOGY 409 and BIOLOGY 509.
- 512 Molecular Mechanisms of Plant Development** 3 Physiology of growth; metabolism during development and reproduction.
- 513 Plant Metabolism** 3 Metabolic processes unique to plants, including the primary incorporation of nitrogen, sulfur, carbon dioxide and phosphate into bio-molecules.
- 514 Fish Genetics** 2 Chromosomal, biochemical, quantitative, and ecological aspects of fish genetics with emphasis on applications to aquaculture and fish management. Cooperative: Open to UI degree-seeking students.
- 517 Stress Physiology of Plants** 3 Temperature, light, salinity, water effects on physiological processes; mechanistic understanding of stress.
- 519 Introduction to Population Genetics** 3 Survey of basic population and quantitative genetics. Cooperative: Open to UI degree-seeking students.
- 520 Conservation Genetics** 2 Genetic studies and approaches relevant to efforts to conserve threatened and endangered populations of organisms.
- 521 Quantitative Genetics** 3 Course Prerequisite: BIOLOGY 519. Fundamentals of quantitative genetics; evolutionary quantitative genetics. Cooperative: Open to UI degree-seeking students.
- 531 Principles of Systematic Biology** 3 Systematic theory; history and current views; approaches to phylogenetic analysis and classification.
- 533 Modern Methods in Phylogenetics** 4 (2-6) Selecting, gathering, and analyzing morphological, cytological, molecular data for phylogenetic and evolutionary studies.
- 534 Modern Methods in Population Genomics** 3 Course Prerequisite: BIOLOGY 519. Problems and prospects of designing a study with genomic data: from raw data to demography and selection inferences.
- 537 Plant Cell Biology** 3 Structure and function of plant cells including membrane biology, protein targeting and molecular signaling with emphasis on current research.
- 540 Stable Isotope Theory and Methods** 3 (2-3) Theory and practice of measuring stable isotope ratios of biologically important elements; training in the use of isotope mass spectrometers. Cooperative: Open to UI degree-seeking students.
- 544 Nitrogen Cycling in the Earth's Systems** 3 Nitrogen dynamics in terrestrial, aquatic, and atmospheric systems; nitrogen transformations in natural and managed systems and responses to human activities. (Crosslisted course offered as BIOLOGY 544, SOIL SCI 544).
- 548 Evolutionary Ecology of Populations** 3 Evolutionary dynamics of natural populations and the co-evolution of species. Cooperative: Open to UI degree-seeking students.
- 556 Biochemical Adaptation** 3 Relationships between enzyme/macromolecule adaptation and animal performance.
- 559 Hormones, Brain and Behavior** 3 Classical behavioral endocrinology from molecular to whole organisms, integrating evolutionary ecology, neuroethology and behavioral neuroendocrinology.
- 560 Plant Ecophysiology** 3 Relationships of biotic and abiotic environment to plant distribution and evolution through study of physiological processes.
- 561 Environmental Physiology** 3 Individual and evolutionary adaptations to changing environments with emphasis on recent literature.
- 562 Community Ecology** 3 Assembly, essential properties, levels of interactions, succession, and stability of natural communities; emphasizes an experimental approach to community investigation. Credit not granted for both BIOLOGY 462 and BIOLOGY 562. Recommended preparation: BIOLOGY 372.
- 563 Field Ecology** 2 (0-6) Field implementation of descriptive and experimental techniques to quantify the structure, composition, and interactions within natural communities. Field trips required. Cooperative: Open to UI degree-seeking students.
- 564 Molecular Ecology and Phylogeography** 3 Use of genetic markers for the study of ecological phenomena, including kinship, population structure, and phylogeography. Cooperative: Open to UI degree-seeking students.
- 565 Ecology and Evolution of Disease** 3 Disease ecology and evolution with a focus on current literature. Recommended preparation: BIOLOGY 372; BIOLOGY 405. Cooperative: Open to UI degree-seeking students.
- 566 Mathematical Genetics** 3 Mathematical approaches to population genetics and genome analysis; theories and statistical analyses of genetic parameters. (Crosslisted course offered as MATH 563, BIOLOGY 566). Required preparation must include multivariate calculus, genetics, and statistics. Cooperative: Open to UI degree-seeking students.
- 567 Ecological Restoration** 3 Introduction to major issues in restoration ecology; major ecological dimensions of restoration.
- 568 Conservation Ecology** 3 Diagnosis of endangered species, population viability analysis, invasive species ecology, landscape ecology and ecosystem management.
- 569 Ecosystem Ecology and Global Change** 3 Historic and current factors controlling the function of ecosystems and their responses to natural and human caused global change. (Crosslisted course offered as BIOLOGY 469, ENVR SCI 469, BIOLOGY 569, ENVR SCI 569). Credit not granted for both BIOLOGY 469 and 569, or ENVR SCI 469 and 569. Cooperative: Open to UI degree-seeking students.
- 570 Diversity of Plants** 3 Morphological, life history, and ecological diversity of major plant clades; emphasis on principles of homology, character transformation, and macroevolution.
- 571 Quantitative Toolkit for Biologists** 3 Course Prerequisite: STAT 512. Hands-on experience in the exploration, analysis, and interpretation of patterns in modern biological datasets.
- 572 Quantitative Methods and Statistics in Ecology** 4 (3-3) Course Prerequisite: By permission only. Philosophy and methods of formulating hypotheses as mathematical models and confronting them with data.

Department of Biological Systems Engineering

bsyse.wsu.edu
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Regents Professor and Department Chair, J. Tang; Professor and Associate Chair, S. Sablani; Professors, B. K. Ahring, G. V. Barbosa-Cánovas, S. Chen, C. O. Stöckle; J. Wu, Q. Zhang; Associate Professors, M. García-Pérez, H. Lei, P. Ndegwa, R. Peters, B. Yang; Assistant Professors, M. Karkee, L. Khot, S. Sankaran; Research Assistant Professor, M. R. Salazar-Gutierrez; Affiliate Faculty, M. Flury, G. Ganjyal, S. Ha, D. McCool, B. Rasco, V. Yadama; Adjunct Faculty, J. Amonette, W. Elliott, G. Hoogenboom, P. Robichaud, M. Tucker, S. Wang.

BIOLOGICAL SYSTEMS ENGINEERING

Biological and Agricultural Engineering is a multidisciplinary program that provides students flexibility to acquire and apply knowledge of engineering and science in their programs of study and research projects. The Department offers Ph.D. and M.S. degrees in Biological and Agricultural Engineering. Students apply scientific and engineering principles to conduct high-quality research and to disseminate knowledge and technologies in four areas of emphasis: a) food engineering, b) bioenergy and bioproducts engineering, c) land, air, water resources and environmental engineering, and d) agricultural automation engineering.

Applicants to the graduate program should have a B.S. or M.S. in engineering or a closely related degree, with a cumulative Grade Point Average (GPA) 3.0/4.0 or above. Applications must include: official transcripts for all college level work, contact information for three references, statement of intent, and resume. International applicants must include official transcripts and their English translations. Also, English proficiency test scores must be sent from the testing agency directly to Washington State University (University Code#4705).

Student Learning Outcomes

During their training in our graduate program, we expect students to grow professionally and acquire skills for successful careers. Alumni who are successful in their careers will exhibit most, if not all of these features.

1. Academia

- Possess a national and international reputation for excellence in their area
- Value the significance of quality scholarly work
- Are creative and innovative
- Contribute to the knowledge base within their discipline
- Attract funding for their research
- Provide leadership to professional organizations
- Enable undergraduate and graduate engineering students to be successful in their careers

2. Industry

- Effectively manage engineering research and/or development research teams
- Provide leadership in developing industry standards of practice

573 Ancient DNA 3 The prospects and problems associated with the study of ancient DNA are explored through reading and discussing primary literature.

575 Systems Biology of Reproduction 3 Current literature based course on systems biology with a molecular/epigenetic to physiological level understanding of cell, development, disease, and evolutionary biology. Credit not granted for both BIOLOGY 475 and 575.

576 Epigenetics and Systems Biology 3 Current literature based course on epigenetics and systems biology with topics in environmental epigenetics, disease etiology, and role epigenetics in evolutionary biology. Credit not granted for both BIOLOGY 476 and 576.

579 Mathematical Modeling in the Biological and Health Sciences 3 Techniques, theory, and current literature in mathematical modeling in the biological and health sciences, including computational simulation. (Course offered as BIOLOGY 579, MATH 579).

581 Comparative Biology of Social Traditions 3 Phylogenetic and modeling perspectives used to examine the evolution of social learning and cultural transmission in humans and other animals. (Crosslisted course offered as ANTH 581, BIOLOGY 581).

582 Professional Communication in Biology - Grant Writing 2 Mechanics and style of publishing biological research and findings; adaptation of writing to various venues and audiences with emphasis on grant writing.

585 Professional Development and Training for College and University Teaching 2 Preparation for roles as teaching assistants and as instructors of undergraduate classroom education.

589 Advanced Topics in Biology V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent advances in biology.

591 Seminar in Molecular Plant Sciences 1 May be repeated for credit; cumulative maximum 4 hours. A cross-discipline seminar, including botany, crop and soils sciences, horticulture, plant pathology, and molecular plant sciences.

593 Seminar I 1 May be repeated for credit. Literature and problems.

597 Teaching Practicum V 1-4 May be repeated for credit; cumulative maximum 4 hours. Zoology laboratory teaching internship. S, F grading.

598 IPEM Seminar 1 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: By permission only. Symposia and project work sessions for the WSU/UW IGERT: Program in Evolutionary Modeling. (Crosslisted course offered as ANTH 596, BIOLOGY 598). S, F grading.

600 Special Projects or Independent Study V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.

700 Master's Research, Thesis, and/or Examination V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

702 Master's Special Problems, Directed Study and/or Examination V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Biology, Plant Biology, Botany, or Zoology PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

ELECTRON MICROSCOPY

E MIC

586 Special Projects in Electron Microscopy V 2 (0-6) to 3 (0-9) May be repeated for credit. Practical training in one or more areas of electron microscopy; TEM, SEM, ultramicrotomy, specimen processing; confocal fluorescent microscopy. Cooperative: Open to UI degree-seeking students.

587 Special Topics in Electron Microscopy 1 May be repeated for credit; cumulative maximum 4 hours. Cooperative: Open to UI degree-seeking students. S, F grading.

SCIENCE

SCIENCE

101 [SCI] Origins in the Natural World 4 (3-3) Interdisciplinary approach to science in the modern world for non-science majors.

102 [SCI] Dynamic Systems in the Natural World 4 (3-3) Course Prerequisite: SCIENCE 101. Interdisciplinary approach to science in the modern world for non-science majors.

210 Your Future in Life Sciences 2 Exploration of career options in biological sciences with faculty and outside speakers; guide to preparing resume and career plans. (Crosslisted course offered as SCIENCE 210, BIOLOGY 210, MBIOS 210). S, F grading.

430 Methods of Teaching Science 3 Course Prerequisite: Junior standing. Methods, philosophy, and structure of science; application in teaching middle and secondary school science courses. (Crosslisted course offered as BIOLOGY 430, SCIENCE 430).

- Are creative and innovative
 - Develop profitable products or revenue saving manufacturing procedures
 - Provide vision for future direction of their companies and for the industry
3. Government service
- Provide expert technical knowledge in decision making processes
 - Provide leadership within their technical and professional societies
 - Contribute to the development of public policies
 - Provides global perspective in the use of technical knowledge

Description of Courses

BIOLOGICAL SYSTEMS ENGINEERING

BSYSE

- 512 Research and Teaching Methods** 3 (2-3) Graduate research with an emphasis on biological systems engineering and college instruction.
- 530 Machine Vision for Biological Systems** 3 Image analysis techniques as applied to machine vision applications integrated into autonomous equipment used in specialty crops.
- 532 Electrohydraulic Systems Control** 3 Fluid power transmission, E/H control, control systems and controller design.
- 541 Instrumentation and Measurements** 3 (2-3) Basic engineering concepts involving instrumentation including measurement systems, sensors, data acquisition, signal processing, and analysis.
- 550 Soil and Water Conservation Engineering** 3 Land, water and air conservation emphasizing on soil and water engineering concepts, state of science solution techniques, and engineering design.
- 551 Advanced Biological Systems Engineering Topics** V 1-4 May be repeated for credit; cumulative maximum 6 hours. Directed group study of selected advanced topics in biological systems engineering. Cooperative: Open to UI degree-seeking students.
- 552 Advanced Biological Systems Engineering Topics** V 1-4 May be repeated for credit. Directed group study of selected advanced topics in biological systems engineering. Cooperative: Open to UI degree-seeking students.
- 554 Aquatic System Restoration** 3 Study of natural, damaged and constructed ecosystems with emphasis on water quality protection and restoration of lakes, rivers, streams and wetlands. (Crosslisted course offered as CE 585, BSYSE 554, ENVR SCI 585). Required preparation must include CHEM 345; MBIOS 101. Required preparation must include CHEM 345; MBIOS 101. Cooperative: Open to UI degree-seeking students.

- 555 Natural Treatment Systems** 3 Principles and design procedures of natural systems for wastewater treatment for agricultural and non-agricultural applications. (Crosslisted course offered as CE 555, BSYSE 555). Cooperative: Open to UI degree-seeking students.
- 556 Surface Hydrologic Processes and Modeling** 3 (2-3) Fundamental hydrologic processes, governing equations and solution methods, GIS techniques commonly used in hydrology, class project on modeling surface hydrology.
- 557 Nutrient Cycling and Transport** 3 Cycling of carbon, nitrogen and phosphorus at global and watershed scales; modeling of transportation and transport in agricultural systems
- 558 Groundwater Flow and Contaminant Transport** 4 (3-3) Physics of flow and contaminant transport in saturated porous media including governing equations, well hydraulics and computer modeling.
- 560 Aquatic Chemistry** 3 Chemical principles as applied to natural environmental system, water supply and pollution and control engineering. (Crosslisted course offered as CE 583, BSYSE 560). Cooperative: Open to UI degree-seeking students.
- 564 Agricultural Waste and Air Quality Management** 3 Detailed analyses of agricultural wastes and their potential adverse impacts on the environment; current management systems; reuse and recycle.
- 581 Advanced Physical Properties of Foods** 3 Analysis, modeling, and experimental procedures to measure food physical properties for use in food processing system design.
- 582 Food Process Engineering I** 3 Design of food processing systems; design and simulation of sterilization and pasteurization processes in foods. Cooperative: Open to UI degree-seeking students.
- 583 Food Process Engineering II** 3 Design of food separation unit operations including concentration, dehydration, and membrane processes.
- 584 Thermal and Nonthermal Processing of Foods** 3 Food preservation methods based on application of thermal and nonthermal processes.
- 585 Food Packaging** 3 Properties of packaging materials, manufacturing of packages, shelf-life testing and food packaging interaction.
- 593 Renewable Energy Technologies** 3 Thermochemical biorefinery technologies for biofuels and bioproducts; facility operations, analysis, and design of integrated processes for biofuel and bioproduct production
- 594 Design and Analysis of Biomass Conversion Processes and Systems** 3 Analysis of bioprocessing and biotreatment processes including energetics, stoichiometry, species competition, process infiltration, product separation and optimization.

- 595 Biosystems Engineering for Fuel and Chemicals** 3 Design and optimization of biological systems for industrial functions, modeling and simulation of cell processes, bioreactors and system integration.
- 596 Biomass Thermo-Chemical Conversion** 3 Biomass chemistry, analytical thermochemistry, torrefaction, pyrolysis, gasification and combustion; characterization and uses of thermochemical products.
- 597 Biomass Biological Process Engineering** 3 Technical issues in the biological process engineering field, commercial application and evaluation of new technologies in resource, environment and economic contexts.
- 598 Graduate Seminar** 1 May be repeated for credit. Required of all graduate students in biological systems engineering. S, F grading.
- 700 Master's Research, Thesis, and/or Examination** V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 702 Master's Special Problems, Directed Study and/or Examination** V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.
- 800 Doctoral Research, Dissertation, and/or Examination** V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Biological and Agricultural Engineering or Engineering Science PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Carson College of Business

business.wsu.edu
Todd Hall 570
509-335-3596

CARSON COLLEGE OF BUSINESS *Dean and Professor, L. Hunter; Senior Associate Dean, D. Sprott; Associate Deans, J. Cullen, T. Tripp, N. Swanger; Assistant Dean, C. Oliver.*

The Carson College of Business (CCB) at Washington State University prepares students to become innovative and purposeful leaders with the skill and knowledge to succeed in the global marketplace. CCB graduates lead insightfully by effectively applying core business competencies, employing a global

perspective, and embracing diversity. CCB students, graduates, and researchers apply integrated business tools and entrepreneurial perspectives to successfully execute and deliver transformational innovations across disciplines and around the world.

The Carson College of Business fosters positive societal change by advancing the understanding of the impact of business on society and the environment, enabling graduates to lead responsibly and make meaningful contributions to the world's business communities. Students enjoy top rate, modern educational facilities in Todd Hall, the home of the college, located at the heart of the WSU campus. Wireless computer connectivity in every classroom and study areas enable students to collaborate both in and out of the classroom. Facilities such as the Financial Markets Lab, the Marriott Hospitality Teaching Center, and the Center for Behavioral Business Research support the delivery of cutting-edge content and enable students to develop real-world skills. Staff in the Carson Center for Student Success serve more than 2,000 students per semester through a wealth of professional development activities that prepare them to become strong leaders, competitive job seekers and responsible citizens in a global society. The Carson Center houses academic advising, careers and involvement, study abroad and scholarships. More than 25,000 WSU business alumni comprise a professional network throughout the world.

The Carson College of Business is among two percent of business schools worldwide to achieve accreditation by the Association to Advance Collegiate Schools of Business (AACSB), the world's premier business education accrediting body, at the baccalaureate, master's, and doctoral levels. Its undergraduate business programs are ranked in the top 100 in the nation by *U.S. News & World Report*. The Carson College of Business online MBA and Executive MBA programs have been ranked in the top 25 by *U.S. News & World Report* since the ranking began 2013. In addition to the accounting programs receiving specialized AACSB accreditation, the International Business program maintains a consistent spot in the top 25 in the nation (*U.S. News & World Report*). The CCB sends more students abroad than any other college at WSU. The School of Hospitality Business Management is a top provider of career services to its students, and the program is one of the oldest in the country, celebrating its 80th anniversary in 2012.

The faculty in the Carson College of Business have identified six competencies our students should have upon completion of an undergraduate degree in business: 1) mastery of core business knowledge and skills; 2) critical thinking; 3) innovative and entrepreneurial thinking; 4) the ability to write clearly and concisely without sacrificing content; 5) the ability to communicate well orally; and 6) the ability to effectively lead and work in teams.

Faculty across disciplines produce scholarly and applied research at the main campus in Pullman as well as at urban campuses in Everett, Vancouver, and the Tri-Cities. International activities include academic centers in China and Switzerland as well as thriving partnerships with several schools around the globe. Innovative online programs supplement face-to-face offerings. For more information and news about the college, its students, and programs, visit business.wsu.edu.

Student Learning Outcomes

Upon completion of the Bachelor of Arts in Business Administration, graduates will have the knowledge to be able to:

Goal 1: Solve business problems, supported by appropriate analytical techniques.

Goal 2: Demonstrate cultural awareness and will be able to identify and evaluate the global implications of business decisions.

Goal 3: Demonstrate professional, socially responsible, and ethical awareness.

Goal 4: Be effective business communicators.

Certification Requirements

Given high demand for business courses and strict accreditation requirements, certifying as a business major is competitive and course enrollments are limited. A student must meet the following minimum requirements to be eligible to apply to certify a major in business: 1) Complete the following certification courses with an average GPA of 2.50 or higher: ACCTG 230, 231; B LAW 210; MGTOP 215; ECONS 101, 102; ENGLISH 101; MATH 201, 202; and MIS 250; 2) Have a WSU cumulative GPA of at least 2.5; and 3) Have earned at least 60 credit hours. Students will then be placed in rank order based on cumulative GPA and other performance criteria. The top students then are certified based on the number of spots available that semester.

To be eligible to apply to certify a business minor, a student must be certified in a major, have a cumulative GPA of at least 2.5, and have earned at least 60 credit hours. Students will then be placed in rank order based on cumulative GPA and other performance criteria. The top students then are certified based on the number of spots available that semester.

Students on the Pullman campus must apply online for enrollment into the Business and Hospitality Business Management degree programs at <http://business.wsu.edu/undergraduate/certify/majors-requirements> to be considered in the applicant pool.

Graduation Requirements

A minimum cumulative GPA of 2.5 in all Carson College of Business (CCB) courses required for the major is required for graduation. The calculation will only count WSU business courses that are taught by the CCB including HBM courses. Economic Sciences courses or any other courses outside the college are not included.

General Program Requirements

General course requirements, core courses, and fields of specialization are presented below. Requirements vary depending upon the field of specialization selected. For a detailed description of degree requirements (with changes approved since publication of the latest catalog), see current degree requirements for BA majors, available in the Carson College of Business.

By the completion of 60 hours of credit, all students, including transfer students, must have completed English, Math and 100-200-level CCB core courses: ACCTG 230, 231; B LAW 210; MGTOP 215; ECONS 101, 102; ENGLISH 101; MATH 201, 202; and MIS 250. Enrollment in 300-level business courses is restricted to those students who have met these requirements and have certified as BA or HBM majors. Students certified in non-business majors

may enroll in required 300-400-level business courses with permission of the department chair as space is available.

All students majoring in business must complete 60 credit hours of their course work outside of the Carson College of Business.

WSU Course Requirements: At least 50% of business core and major specialization courses and at least nine 300-400-level business courses must be WSU courses. A WSU course is a course that does not require evaluation for transfer credit.

The chair of the department and/or the associate dean of the college must approve in writing any business courses to be satisfied by transfer, correspondence, independent study, or other credit. Additional transfer, correspondence, and independent study credit (within University limits on these credits) may count toward the 120 hours required for the degree and/or satisfy requirements other than major courses.

Only general elective courses that are not University Common Requirements (UCORE), not core/major requirements, and not offered by the CCB may be taken pass, fail.

An honors senior project is required for Honors students.

International Experience Requirement

Learning Outcomes for International Experience Requirements:

On completing the International Experience Requirement, students should be able to:

- Appreciate differences in the external environmental factors that affect global business
- Identify the specific elements of the cultural environment that affect global business decisions
- Evaluate the implications of the external environmental factors on global business decisions
- Incorporate global economic, political and cultural factors when making global business recommendations

Students within the Carson College of Business must complete one of the following:

1. Study abroad for 6 or more credit hours. Two smaller study abroad programs may be cumulated to meet the entire 6 credit-hour requirement. International students in the Carson College of Business (not including WSU Global students) will meet their study abroad requirement through their study in the United States.
2. Complete a major or minor in a foreign language.
3. Students that demonstrate proficiency in a foreign language (e.g., STAMP test) will be deemed to have met the Carson College of Business International Experience Requirement. [Honors College students that meet their demonstrated proficiency in a foreign language will also be deemed to have met the Carson College of Business International Experience Requirement.]
4. Complete two of the following requirements:
 - a. The Global Leadership Certificate.
 - b. A certificate with a major international component (e.g. The East Asia Program) as approved by the administrative head of the Department of Marketing and International Business.
 - c. A brief study abroad program of at least 3 credit hours.

d. An international internship approved by the Department of Marketing and International Business (maximum of 3 credit hours).

e. An "international course" as approved by the Department of Marketing and International Business. Approved courses include: AMDT 413; ANTH 301, 306, 307, 309, 312, 316, 317, 320, 330, 350, 370, 405, 417, 418, 450, 469; ARCH 428; ASIA 302, 315, 373, 374, 477, 479; BIOLOGY 401; CES 301, 325, 372, 377, 379, 380, 401, 405, 421, 426, 470; COMSOC 321; CRM J 405; CROPS SCI 360; ECONS 427, 428, 430, 433, 453; ENGLISH 373, 410, 457; ENVR SCI 410; FINE ART 331; FOR LANG 410; GEOLOGY 390; H D 350, 403; HISTORY 331, 373, 374, 436, 464, 466, 473, 477, 479, 491, 492, 494, 495; HUMANITY 350; NATRS 300, 312; PHIL 314, 315; POL S 314, 424, 427, 435; RUSSIAN 410; SOC 331, 332, 375, 415; SOIL SCI 360; TCH LRN 480, 487; WOMEN ST 316, 332, 340, 406.

f. An approved 300-400-level "international business or economics course". Approved courses include: ACCTG 420; ECONS 327; I BUS 415, 416, 435, 453, 470, 482, 496; MIS 441.

g. At least 3 credits in a foreign language.

h. An accepted petition to the Department of Marketing and International Business to allow the use of extensive international travel experiences at the collegiate or corporate level for up to 3 credit hours towards the International Experience Requirement. Although petitions must be approved prior to the international travel, exceptional cases can be reviewed on a case-by-case basis. Normally such an experience will be at least three months in duration.

i. A University course research project with an international business research focus that is a significant part of the course learning component, and that constitutes 40% or more of the class. The petition for allowing a project work to count towards the International Experience Requirement should be signed off by the course instructor, and the final approval will be made by the Department of Marketing and International Business for Pullman based students, and an IBUS Fellow or Area Director for urban campus students. *

j. Participate as finalists in an international or global case competition (e.g., Global Case Competition conducted by WSU International Programs). The determination of whether a case competition can be counted towards the International Experience Requirement will be made through a petition to the Department of Marketing and International Business. Although only final round participants can be considered, exceptional cases that did not make it to the final round can also be considered on a case-by-case basis by the Department of Marketing and International Business, which will make the final approval.

5. Complete a minimum of one year of international experience in any of the following areas: military service, Peace Corps, Volunteer work with an organization, missionary work, or other. Documentation is required for approval.

* Students also need to obtain pre-approval from course instructor prior to start of project work on the petition form that is available with advisors at the respective campus locations.

Double Majors in Business

Students may double major within business provided that they satisfy the requirements of

the second major. At a minimum, students must complete 15 additional credits (18 credits for accounting) from among those courses specifically designated by the second major and distinct from those used to satisfy the first major.

Second Bachelor's Degree

Students who have received a bachelor's degree in another area may obtain a Bachelor of Arts degree in Business Administration by presenting total credits of at least 150 hours and by fulfilling the following departmental requirements: ACCTG 230, 231; B LAW 210; COM 102 or H D 205; ECONS 101, 102; ENGLISH 402 or 403; FIN 325; IBUS 380, MATH 201, 202; MGTOP 215, 340; MGMT 301 and 491 or 492; MIS 250; MKTG 360; POL S elective; SOC or PSYCH [SSCI]; and the courses required for the student's chosen major in business.

The second degree can usually be completed in less than two years, depending on the number of business requirements completed as part of the first undergraduate degree. Second degree students must also go through the certification process (see Certification Requirements above) before they can enroll in 300-400-level business courses. Students should consult the CCB Carson Center for Student Success for specific requirements.

Transfer Students

Students planning to transfer to Washington State University at the end of the freshman or sophomore year should follow, as closely as possible, the general and core course requirements set forth above. If this is done, there should be no difficulty in completing the requirements for the bachelor's degree within the normal period of four years. It should also be noted that courses taken at community colleges are not accepted as transferable equivalents to 300-400-level courses at WSU.

Master of Business Administration

mba.wsu.edu

Todd 121

509-335-7617

Faculty: S. Ahn, J. Arthurs, N. Ashley, T. Baker, J. Bravo, K. Butterfield, Jane Cote, Joseph Cote, R. Delisle, J. Goodstein, R. Greenberg, Y. Gregoire, D. Gursoy, J. Harris, R. Jenefsky, J. Johnson, K. Joshi, D. Knuff, V. Kolde, S. Liu, C. Munson, J. Nofsinger, D. Paul, F. Peterson, R. Pike, J. Rose, R. Sanchez, S. Sarker, P. Skilton, D. Sprott, T. Tripp, U. Umesh, W. Wu, L. Xu, J. Yamamura.

The full-time MBA program at WSU Pullman features nationally prominent faculty and small cohort groups and encourages frequent and personal interaction among faculty and students. The MBA program focuses on the management of information and hands-on, real-world experiences, including studying abroad. The program is designed to develop data-driven decision making, with a global perspective.

Information about application deadlines is available on our website.

Foundation Curriculum

MBA candidates must have a foundation in business before enrolling in core coursework. The foundation coursework includes the following courses or their equivalents: ACCTG 550; B A 501; B A 502; B A 503; B A 504; B A 600; ECONS 404. Credits for these courses are not counted in the credits required for the degree.

Note: Course descriptions for the MBA are listed under the department that offers the course.

MBA Program Curriculum (32 Credits)

A minimum cumulative GPA of 3.0 is required for the MBA degree.

Core Curriculum (23 credits)

ACCTG 533
BA 514
FIN 526
MKTG 506
MGMT 590
MGMT 593
BA 579 (3 credits)
BA 702 (2 credits)

Electives (9 credits): Students are encouraged to concentrate in one of the following specific areas. Each elective course in the concentration area must be passed with a 3.0 or better GPA. **Business Analytics:** MKTG 555; MGMT 556; MIS 557. **Finance:** FIN 521; FIN 527; FIN 528; FIN 581. **International:** FIN 581; I BUS 580; I BUS 582; I BUS 600. **Marketing:** I BUS 582; MKTG 507; MKTG 561; MKTG 565; MKTG 577. **Stakeholder Leadership:** ACCTG 541; ACCTG 542; ACCTG 546; B A 520; MGMT 585; MGMT 587; MGMT 589; MKTG 565. **Technology Management:** ENTRP 501; MIS 580; MGTOP 540; MGTOP 581; MGMT 589; MKTG 561.

Students who complete a concentration qualify for a certificate in that area. Not all courses or concentration areas are available on all campuses.

Executive MBA (44 credits)

A minimum cumulative GPA of 3.0 is required for the Executive MBA degree.

ACCTG 533
BA 514
FIN 526
I BUS 580
I BUS 600 or MGTOP 587
MIS 572
MIS 580
MKTG 506
MGMT 588
MGMT 590
MGMT 593
MGMT OP 581
B A 579 (6 credits)
B A 702 (2 credits)

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

BUSINESS ADMINISTRATION, VANCOUVER AND TRI-CITIES CAMPUSES ONLY (120 HOURS)

The following major is available only to students on the Vancouver and Tri-Cities campuses. Students on the Pullman campus may not certify into this major.

Graduation Requirements

A minimum cumulative GPA of 2.5 in all Carson College of Business (CCB) courses required for the major is required for graduation. The calculation will only count WSU business courses that are taught by the CCB including HBM courses. Economic Sciences courses or any other courses outside the college are not included.

Business Administration majors are required to complete a minimum of 9 upper-division business courses in residence. Students within the College of Business must complete an International Learning Requirement option, see catalog for more information.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] or SCIENCE 101 [SCI] ¹	3 or 4
ECONS 101 [SSCI] or 102 [SSCI]	3
ENGLISH 101 [WRTG]	3
Humanities [HUM]	3
MATH 201 ²	3
<i>Second Term</i>	<i>Hours</i>
ECONS 101 or 102	3
HISTORY 105 [ROOT]	3
MATH 202 [QUAN] ³	3
MIS 250	3
Physical Sciences [PSCI] or SCIENCE 102 [SCI] ¹	4 or 3

Second Year

<i>First Term</i>	<i>Hours</i>
ACCTG 230	3
Creative & Professional Arts [ARTS]	3
Diversity [DIVR]	3
SOC [SSCI] or PSYCH [SSCI] ⁴	3
Non-Business Electives ⁵	3
<i>Second Term</i>	<i>Hours</i>
ACCTG 231	3
B LAW 210	3
COM 102 [COMM] or H D 205 [COMM]	3 or 4
MGTOP 215 ⁶	4
POL S Elective	4
Complete Writing Portfolio	
Consider studying abroad this summer ⁷	

Third Year

<i>First Term</i>	<i>Hours</i>
FIN 325	3
I BUS 380	3
MGMT 301	3
MKTG 360	3
300-400-level Business or ECONS Elective ⁸	3
<i>Second Term</i>	<i>Hours</i>
ACCTG 338	3
ENGLISH 402	3
MGMT 401 [M]	3
MGTOP 340	3
Non-Business Electives ⁵	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
FIN 425 [M]	3
400-level Business Electives ⁸	6
Non-Business Electives ⁵	6

<i>Second Term</i>	<i>Hours</i>
MGMT 491 [CAPS] or ENTRP 492 [CAPS]	3
MKTG 495 [M]	3
Non-Business Electives ⁵	6

¹ For a total of 7 credits—one Biological Science [BSCI] and one Physical Science [PSCI] course, including one lab course, or 8 credits of [SCI] designated courses. (SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI], which is offered Spring semester.)

² MATH 201 will be waived with the completion of MATH 202 or equivalent.

³ Alternative to MATH 202 is MATH 171, 140 or 206.

⁴ Required for the major.

⁵ Non-Business courses to equal 60 credit hours.

⁶ MATH/STAT 212 will be accepted as alternative to MGTOP 215 for transfer students.

⁷ All students must complete the International Experience Requirement. Options for completing the requirement can be found in the Carson College of Business Academic Unit section of the catalog under Business. Students should consult with their advisor to determine the best option.

⁸ May not include courses from the business administration core, the set of required business administration courses, or any 498 or 499 courses.

Minors

Business Administration

To be eligible to certify in a Business Administration minor, students must be certified in a major and have a cumulative GPA of 2.5. The minor in business administration requires a minimum of 18 hours, 9 of which must be upper-division with an overall GPA of at least a 2.5 in the required courses. 9 hours must be 300-400 level courses taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. Up to 6 hours may be transferred from another institution. The required courses are ACCTG 230 and 5 College of Business courses (excluding 498 and 499 courses). Students must ensure that they meet all course prerequisites before enrolling in any College of Business courses.

Certificates

Professional Sales Certificate (Vancouver only)

The Professional Sales Certificate Program at WSU is open to all majors. This program prepares students for multiple forms of persuasive communication, creating and delivering value to business customers and effectively managing sales operations. To complete the certificate, students must complete five courses (15 credits) with a 2.5 GPA or better: MKTG 360 (Marketing), MKTG 379 (Professional Sales), MKTG 478 (Sales Management), MKTG 480 (Business-to-Business Marketing), and MGMT 485 (Negotiations).

Description of Courses

BUSINESS ADMINISTRATION

B A

500 Data Analysis for Managers V 1-3 Course Prerequisite: Admission to the MBA program. Descriptive statistics, probability, common, discrete, and continuous distribution functions, sampling and estimation, and statistical inference.

501 Foundations in Marketing V 2-3 May be repeated for credit; cumulative maximum 6 hours. Foundation topics in marketing for MBA students.

502 Foundations in Operations Management V 2-3 May be repeated for credit; cumulative maximum 6 hours. Foundation topics in operations management for MBA students.

503 Foundations in Business Law V 2-3 May be repeated for credit; cumulative maximum 6 hours. Foundation topics in business law for MBA students.

504 Foundations in Finance V 2-3 May be repeated for credit; cumulative maximum 6 hours. Foundation topics in finance for MBA students.

514 Business Analytics: Transforming Data into Decisions 3 Course Prerequisite: Admission to the MBA program. Advanced decision-making concepts utilizing relevant datasets for data-driven problem-solving and formulating decision analyses to evaluate and recommend management action.

520 Resources, Stakeholders and Competitive Advantage 3 Course Prerequisite: Admission to the MBA program. Creating competitive advantage using resources provided by key stakeholders.

579 MBA Capstone V 1-3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Admission to the MBA program. Analyze, evaluate, and recommend management actions for a specific strategic business project (for an existing organization or new venture).

596 Doctoral Topics V 1-4 May be repeated for credit; cumulative maximum 15 hours. Course Prerequisite: Admission to PhD programs in business. Advanced topics in business research and theory.

598 Research and Professional Development 1 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Admission to PhD programs in business. Ph.D.-level professional development colloquium designed to improve research, teaching, and presentation skills and to provide professional socialization. S, F grading.

600 Special Projects or Independent Study V 1-18 May be repeated for credit. Course Prerequisite: Admission to the MBA program. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.

702 Master's Special Problems, Directed Study, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admission to the MBA program. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Business Administration PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Department of Accounting

business.wsu.edu/accounting/
Todd 242
509-335-8541

Chair and Associate Professor, S. Gill; Professors, J. Gramlich, R. Greenberg, D. Sanders, R. Toolson, B. Wong-On-Wing; Associate Professors, J. Cote, C. Latham; Assistant Professors, B. Barnes, L. Chen, M. Cussatt, K. Harris, A. Simonov, L. Xu; Clinical Faculty, B. Holbrook, K. Houser, K. Jones, N. Pearson.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

ACCOUNTING (120 HOURS)

The objectives of the Bachelor of Arts in Business Administration with a major in accounting are to provide knowledge about practical and conceptual accounting, basic accounting information systems, financial reporting and taxation, auditing, and the use of accounting information for managerial decision-making purposes. This provides preparation for careers in private, governmental, and non-profit accounting. It also provides a foundation to enter the Master of Accounting program for those interested in a professional career in public accounting or consulting.

Graduation Requirements

A minimum cumulative GPA of 2.5 in all Carson College of Business (CCB) courses required for the major is required for graduation. The calculation will only count WSU business courses that are taught by the CCB including HBM courses. Economic Sciences courses or any other courses outside the college are not included.

Accounting majors are required to complete a minimum of 9 upper-division business courses in

residence. Students within the College of Business must complete an International Experience Requirement option, see catalog for more information.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] or SCIENCE 101 [SCI] ¹	3 or 4
ECONS 101 [SSCI] or 102 [SSCI]	3
ENGLISH 101 [WRTG]	3
Humanities [HUM]	3
MATH 201 ²	3

<i>Second Term</i>	<i>Hours</i>
ECONS 101 or 102	3
HISTORY 105 [ROOT]	3
MATH 202 [QUAN] ³	3
MIS 250	3
Physical Sciences [PSCI] or SCIENCE 102 [SCI] ¹	4 or 3

Second Year

<i>First Term</i>	<i>Hours</i>
ACCTG 230	3
Creative & Professional Arts [ARTS]	3
Diversity [DIVR]	3
SOC [SSCI] or PSYCH [SSCI] ⁴	3
Non-Business Electives ⁵	3

<i>Second Term</i>	<i>Hours</i>
ACCTG 231	3
B LAW 210	3
COM 102 [COMM] or H D 205 [COMM]	3 or 4
MGTOP 215 ⁶	4
POL S Elective	3
Complete Writing Portfolio	
Consider studying abroad this summer ⁷	

Third Year

<i>First Term</i>	<i>Hours</i>
ACCTG 330	3
ACCTG 335 or 338	3
FIN 325	3
MGMT 301	3
MKTG 360	3

<i>Second Term</i>	<i>Hours</i>
ACCTG 331	3
ACCTG 335 or 338	3
I BUS 380	3
MGTOP 340	3
Non-Business Electives ⁵	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
ACCTG 433 [M]	3
400-level ACCTG course ⁸	3
Non-Business Electives ⁵	9

<i>Second Term</i>	<i>Hours</i>
ACCTG 438 [M] or ACCTG 439 [M]	3
ENGLISH 402	3
MGMT 491 [CAPS] or ENTRP 492 [CAPS]	3
400-level ACCTG course ⁸	3
Non-Business Electives ⁵	1

¹ For a total of 7 credits—one Biological Science [BSCI] and one Physical Science [PSCI] course,

including one lab course, or 8 credits of [SCI] designated courses. (SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI], which is offered Spring semester.)

² MATH 201 will be waived with the completion of MATH 202 or equivalent.

³ Alternative to MATH 202 is MATH 171, 140 or 206.

⁴ Required for the major.

⁵ Non-Business courses to equal 60 credit hours.

⁶ MATH/STAT 212 will be accepted as alternative to MGTOP 215 for transfer students.

⁷ All students must complete the International Experience Requirement. Options for completing the requirement can be found in the Carson College of Business Academic Unit section of the catalog under Business. Students should consult with their advisor to determine the best option.

⁸ Any 400-level Accounting course, B LAW 411, MGMT 401, 485, 487, MGTOP 470, MKTG 379, or any 300-400-level MIS or FIN course. May not include courses from the business administration core, the set of required accounting courses, or any 498 or 499 courses.

Description of Courses

ACCOUNTING

ACCTG

230 Introduction to Financial Accounting

3 Course Prerequisite: Sophomore standing. Introduction to corporate financial reporting via the preparation and interpretation of financial statements.

231 Introduction to Managerial Accounting

3 Course Prerequisite: ACCTG 230. Introduction to managerial accounting; generation and use of accounting data for planning and controlling business operations.

330 Intermediate Accounting I

3 Course Prerequisite: Certified major or minor in the College of Business. Theory underlying the determination of income; analysis of financial statements.

331 Intermediate Accounting II

3 Course Prerequisite: ACCTG 330; certified major or minor in the College of Business. Continuation of ACCTG 330.

335 Introduction to Taxation

3 Course Prerequisite: Certified major or minor in the College of Business. Fundamentals of tax information use in making sound business and financial decisions.

338 Cost Accounting

3 Course Prerequisite: ACCTG 231; certified major or minor in the College of Business. Management uses of cost information; cost systems and system design; cost analysis.

420 Accounting and Culture

3 Course Prerequisite: Certified major or minor in the College of Business. Cultural differences and how they affect accounting practices and standards in a variety of countries. Not an accounting technical course.

- 430 Advanced Accounting** 3 Course Prerequisite: ACCTG 330; certified major or minor in the College of Business. Partnership equities and extended forms of corporate ownerships and entities. Recommended preparation: ACCTG 331.
- 433 [M] Accounting Systems and Auditing** 3 Course Prerequisite: ACCTG 330; certified major or minor in the College of Business. Accounting systems design; internal control and computerization.
- 435 Individual Income Taxes** 3 Course Prerequisite: Certified major or minor in the College of Business. The study of individual income taxes from both compliance and planning perspectives. Credit not granted to those taking ACCTG 335 prior to Fall 1999. Recommended preparation: ACCTG 335.
- 437 Professional Research** 3 Course Prerequisite: ACCTG 331; ACCTG 335; certified major or minor in College of Business. Methodology used by accounting professionals to research applied problems and communicate results.
- 438 [M] Advanced Cost Accounting and Management** 3 Course Prerequisite: ACCTG 338; certified major or minor in the College of Business. Cost/managerial accounting as it is used for decision making and strategic planning; emphasis on budgeting, product cost, and performance measurement.
- 439 [M] Auditing** 3 Course Prerequisite: ACCTG 330; ACCTG 433; certified major or minor in the College of Business. Nature of auditing, generally accepted auditing standards, and audit procedures as related to auditing of financial statements by independent accountants.
- 443 Business Processes and Controls** 3 Course Prerequisite: Certified major or minor in the College of Business. Introduction to business processes and internal controls, including risk assessment and internal audit. Recommended preparation: ACCTG 433; ACCTG 439.
- 496 Special Topics** 3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Certified major or minor in the College of Business. Contemporary topics in accounting including international financial reporting standards, forensic accounting, and international accounting.
- 498 Accounting Internship** V 2-15 May be repeated for credit; cumulative maximum 15 hours. Course Prerequisite: By department permission. Cooperative educational internship with a business, government or non-profit organization. S, F grading.
- 499 Special Problems** V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 530 Accounting Theory** 3 Course Prerequisite: Admission to the Master of Accounting program. Recent developments with respect to the determination of income and the valuation of assets.
- 532 Contemporary Accounting Cases and Problems** 3 Course Prerequisite: Admission to the Master of Accounting program. Accounting theory applied to external financial reporting practices.
- 533 Accounting, Performance Measurement and Controls** 3 Course Prerequisite: Admission to the MBA program. Managerial evaluation of budgeting, cost accounting, and financial analysis techniques; their utilization in control of operations.
- 535 Advanced Taxation** 3 Course Prerequisite: Admission to the Master of Accounting program. Federal income tax impact on corporations, S corporations, partnerships, estates, trusts and their beneficial owners.
- 537 Professional Research** 3 Course Prerequisite: Admission to the Master of Accounting program. Methodology used by accounting professionals to research applied problems in taxation, accounting, and auditing; communicate results.
- 538 Seminar in Cost/Managerial Accounting** 3 Course Prerequisite: Admission to the Master of Accounting program. Cost concepts, cost and managerial accounting systems; current issues and research in cost and managerial accounting.
- 539 Seminar in Public Accounting and Auditing** 3 Course Prerequisite: Admission to the Master of Accounting program. Public accounting and auditing to present; current issues including statistical sampling and computers.
- 540 Corporate Taxation** 3 Course Prerequisite: Admission to the Master of Accounting program. Application of federal tax provisions and rules pertaining to corporations and shareholders; tax planning and consequences of corporate decisions.
- 541 Flow Through Entities** 3 Course Prerequisite: Admission to the Master of Accounting program. Tax law and preparation requirements for entities in which tax elements pass thorough to the owner's individual income tax return.
- 542 Gifts, Estates and Trusts** 3 Course Prerequisite: Admission to the Master of Accounting program. Estate and gift tax law.
- 543 Special Topics in Accounting** 3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Admission to the Master of Accounting program. Critical topics in accounting including new developments.
- 544 Advanced Accounting Systems and Auditing** 3 Course Prerequisite: Admission to the Master of Accounting program. Advanced topics in accounting systems, auditing and controls.
- 545 International Taxation** 3 Course Prerequisite: Admission to the Master of Accounting program. Tax issues for international transactions of businesses and individuals.
- 546 Accounting for Income Taxes** 3 Course Prerequisite: Admission to the Master of Accounting program. Comprehensive coverage of accounting income taxes.
- 550 Introduction to Financial and Managerial Accounting** V 2-3 Course Prerequisite: Admission to the MBA program. Fundamentals of financial and managerial accounting; primarily for graduate students who wish to meet the MBA core requirements in accounting.
- 596 Doctoral Topics** 3 May be repeated for credit; cumulative maximum 15 hours. Course Prerequisite: Admission to PhD programs in business. Advanced topics in accounting.
- 600 Special Projects or Independent Study** V 1-18 May be repeated for credit. Course Prerequisite: Admission to the MBA, Master of Accounting, or Business PhD programs. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 702 Master's Special Problems, Directed Study, and/or Examination** V 1-18 May be repeated for credit. Course Prerequisite: Admission to the Master of Accounting program. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.
- 800 Doctoral Research, Dissertation, and/or Examination** V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Business Administration - Accounting PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

BUSINESS LAW

B LAW

210 Law and the Legal Environment of Business 3 Fundamentals of business law; the legal system, legal reasoning, public, commercial, managerial and property law, and government regulation.

411 Legal Environment of Business II 3 Course Prerequisite: B LAW 210; certified major or minor in the College of Business. Law of agency, partnerships, limited liability companies and corporations; and securities regulation.

498 Business Law Internship V 2-15 May be repeated for credit; cumulative maximum 15 hours. Course Prerequisite: By department permission. Cooperative educational internship with a business, government or nonprofit organization. S, F grading.

499 Special Problems V 1-4 May be repeated for credit. Course Prerequisite: By department permission. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.

510 Business Law and Ethics 3 Course Prerequisite: Admission to the MBA or Business PhD programs. Legal process and reasoning; commercial, managerial, and employment law; government regulations; contracts, torts, crimes; ethical conflicts and ethical decision making.

511 Business Law II 3 Course Prerequisite: Admission to the Master of Accounting program. Law of partnerships, corporations, securities regulations, negotiable instruments, secured transactions, property, insurance and bankruptcy; government regulation of businesses and professions.

Department of Finance and Management Science

business.wsu.edu/finance/
Todd Hall Add 470
509-335-8727

Safeco Distinguished Professor of Insurance, Professor, and Department Chair, G. Lai; Mutual of Enumclaw/Field Distinguished Professorship in Insurance and Professor, M. McNamara; Brinson Chair and Professor, G. Jiang; Omar Carey Chair and Professor, D. Whidbee; Professors, S. Ahn, S. Fotopoulos, C. Munson; Associate Professors, T. Baker, S. Liu; Assistant Professors, D. Allredge, D. Fairhurst, B. McTier, D. Paul (Tri-Cities), X. Wu; Clinical Professors, J. Kallberg, M. Reyes. Adjunct Professors, J. Koal, A. Sorensen;

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

FINANCE (120 HOURS)

Preparation for careers in financial management, investment analysis, financial institutions management, financial services, real estate, or risk management and insurance.

Graduation Requirements

A minimum cumulative GPA of 2.5 in all Carson College of Business (CCB) courses required for the major is required for graduation. The calculation will only count WSU business courses that are taught by

the CCB including HBM courses. Economic Sciences courses or any other courses outside the college are not included.

Finance majors are required to complete a minimum of 9 upper-division business courses in residence. Students within the College of Business must complete an International Experience Requirement option, see catalog for more information.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] or SCIENCE 101 [SCI] ¹	3 or 4
ECONS 101 [SSCI] or 102 [SSCI]	3
HISTORY 105 [ROOT]	3
Humanities [HUM]	3
MATH 201 ²	3

<i>Second Term</i>	<i>Hours</i>
ECONS 101 or 102	3
ENGLISH 101 [WRTG]	3
MATH 202 [QUAN] ³	3
MIS 250	3
Physical Sciences [PSCI] or SCIENCE 102 [SCI] ⁴	4 or 3

Second Year

<i>First Term</i>	<i>Hours</i>
ACCTG 230	3
B LAW 210	3
Creative & Professional Arts [ARTS]	3
Diversity [DIVR]	3
Non-Business Electives ⁴	3

<i>Second Term</i>	<i>Hours</i>
ACCTG 231	3
COM 102 [COMM] or H D 205 [COMM]	3 or 4
MGTOP 215 ⁵	4
SOC [SSCI] or PSYCH [SSCI] ⁶	3
Non-Business Electives ⁴	3
Complete Writing Portfolio	
Consider studying abroad this summer ⁷	

Third Year

<i>First Term</i>	<i>Hours</i>
FIN 325	3
MGMT 301	3
MGTOP 340	3
MKTG 360	3
POL S Elective	3

<i>Second Term</i>	<i>Hours</i>
ACCTG 330	3
FIN 421	3
FIN 425 [M]	3
I BUS 380	3
300-400-level FIN Elective ⁸	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
FIN 427 [M] or FIN 437 [M]	3
300-400-level FIN Elective ⁸	3
Non-Business Electives ⁴	9

<i>Second Term</i>	<i>Hours</i>
ENGLISH 402	3
MGMT 491 [CAPS] or ENTRP 492 [CAPS]	3
300-400-level Business Elective ⁹	3
Non-Business Electives ⁴	4

¹ For a total of 7 credits—one Biological Science [BSCI] and one Physical Science [PSCI] course, including one lab course, or 8 credits of [SCI] designated courses. (SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI], which is offered Spring semester.)

² MATH 201 will be waived with the completion of MATH 202 or equivalent.

³ Alternative to MATH 202 is MATH 171, 140 or 206.

⁴ Non-Business courses to equal 60 credit hours.

⁵ MATH/STAT 212 will be accepted as alternative to MGTOP 215 for transfer students.

⁶ Required for the major.

⁷ All students must complete the International Experience Requirement. Options for completing the requirement can be found in the Carson College of Business Academic Unit section of the catalog under Business. Students should consult with their advisor to determine the best option.

⁸ Two 300-400-level FIN electives which cannot be from the business administration core, the set of required FIN courses, or any 498 or 499 courses.

⁹ Elective course may include ECONS 301 or 305. May not include courses from the business administration core, the set of required FIN courses, or any 498 or 499 courses.

Description of Courses

FINANCE

FIN

223 [QUAN] Personal Finance 3 Consumer credit, financial institutions, investments, mutual funds, insurance, social security, home ownership, taxes, estate planning. Credit not applicable to business major requirements.

325 Introduction to Financial Management 3 Course Prerequisite: ACCTG 231; ECONS 101 or 198; MGTOP 215, STAT 212, STAT 360, or STAT 370; certified major (any college); junior standing. Time value of money, financial securities and markets, financial decision making, valuation techniques, and cost of capital.

345 Real Estate 3 Course Prerequisite: FIN 325 or concurrent enrollment; certified major or minor in the College of Business. Relationships between location and value; patterns of urban land use; legal, financial, and organizational framework of the real estate business.

346 Washington Real Estate Regulations 1 Washington real estate regulations found in the Revised Code of Washington (RCW) and the Washington Administrative Code (WAC). S, F grading.

350 Risk and Insurance 3 Course Prerequisite: B LAW 210; ECONS 102; certified major or minor in the College of Business, or certified major in Data Analytics. Concepts in risk management and insurance; personal risks and treatment methods; legal principles in risk and insurance; overview of the insurance industry, company operations, and insurance regulation.

- 421 Financial Institutions and Intermediation** 3 Course Prerequisite: FIN 325; certified major or minor in the College of Business. Characteristics of financial markets and institutions; analysis of fixed-income securities; and introduction to financial risk management.
- 422 Financial Institutions Management** 3 Course Prerequisite: FIN 325; certified major or minor in the College of Business. Problems facing financial institution managers and solution techniques; credit risk analysis and management; financial institutions structure and regulation.
- 425 [M] Intermediate Financial Management** 3 Course Prerequisite: FIN 325; certified major or minor in the College of Business. Application of finance theory and principles to corporate decisions such as capital budgeting, cost of capital, financing decisions, and valuation.
- 427 [M] Investment Analysis** 3 Course Prerequisite: FIN 325; certified major or minor in the College of Business. Investment objectives, modern portfolio theory, valuation, equilibrium, market efficiency and asset classes.
- 428 Portfolio Theory and Financial Engineering** 3 Course Prerequisite: FIN 427 or 437; certified major or minor in the College of Business. Pricing of forwards, futures, options, and swaps, financial derivatives markets, and managing portfolio risk.
- 429 Financial Modeling** 3 Course Prerequisite: FIN 325; FIN 421, 425, or 427, or concurrent enrollment; certified major or minor in the College of Business. Corporate finance, portfolio, option pricing, risk management and fixed income modeling.
- 437 [M] Cougar Investment Fund I** 3 Course Prerequisite: FIN 325; certified major or minor in the College of Business. Students manage a portion of the university's endowment; including security analysis, valuation, equilibrium, market efficiency, and modern portfolio theory.
- 438 Cougar Investment Fund II** 3 Course Prerequisite: FIN 325; FIN 427 or 437; certified major or minor in the College of Business. Students manage a portion of the university's endowment. Topics include portfolio risk management, return attribution, private equity, and hedge funds.
- 445 [M] Real Estate Valuation** 3 Course Prerequisite: FIN 325; FIN 345; certified major or minor in the College of Business. Principles and practices of real property valuation; factors affecting real property values and income; appraisal and location theory.
- 447 Real Estate Finance and Investments** 3 Course Prerequisite: FIN 325; certified major or minor in the College of Business. Instruments and institutions of real estate and financing; decision-making tools, mortgage financing analysis, mortgage securities and real estate portfolios.
- 451 Life Insurance and Financial Planning** 3 Course Prerequisite: FIN 325; certified major or minor in the College of Business. Analysis of the personal risks of premature death, poor health, and retirement security; financial planning solutions to these risks, including life insurance, health insurance and annuities.
- 452 Property and Liability Insurance** 3 Course Prerequisite: FIN 350; certified major or minor in the College of Business. Analysis and management of business property, liability and consequential loss exposures; issues in the property and liability insurance industry.
- 456 Risk Management** 3 Course Prerequisite: FIN 325; certified major or minor in the College of Business. Identification and analysis of loss exposures of business and non-profit organizations; application of risk treatment measures including loss control and risk financing alternatives.
- 481 [M] International Finance** 3 Course Prerequisite: FIN 325; certified major or minor in the College of Business. Financial management of multinational businesses; international financial market rates and capital flows. International economic institutions, sources of capital, and investments.
- 496 Special Topics** 3 May be repeated for credit; cumulative maximum 6 hours. Topics may include finance, real estate or risk management/insurance.
- 498 Finance Internship** V 2-15 May be repeated for credit; cumulative maximum 15 hours. Course Prerequisite: By department permission. Cooperative educational internship with a business, government or non-profit organization. S, F grading.
- 499 Special Problems** V 1-4 May be repeated for credit. Course Prerequisite: By department permission. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 500 Macroeconomic Theory I** 3 Introduction to dynamics, growth and investment, overlapping generations models, Ramsey model, consumption and investment. (Crosslisted course offered as ECONS 500, FIN 500). Required preparation must include intermediate macroeconomics and one year of calculus. Required preparation must include intermediate macroeconomics and one year of calculus.
- 501 Microeconomic Theory I** 3 Microeconomic theory, multivariate optimization, consumer and producer theory, competitive partial equilibrium, introduction to imperfect competition. (Crosslisted course offered as ECONS 501, FIN 501). Required preparation must include intermediate microeconomics and one year of calculus. Required preparation must include intermediate microeconomics and one year of calculus.
- 502 Macroeconomic Theory II** 3 Course Prerequisite: ECONS 500. Macroeconomic theory, short-run fluctuations and nominal rigidities, monetary economics and inflation, real business cycle models, unemployment international macroeconomics. (Crosslisted course offered as ECONS 502, FIN 502).
- 503 Microeconomic Theory II** 3 Course Prerequisite: ECONS 501. General equilibrium, welfare economics and social choice, market failure, game theory, economics of information. (Crosslisted course offered as ECONS 503, FIN 503).
- 510 Statistics for Economists** 3 Statistical theory underlying econometric techniques utilized in quantitative analysis of problems in economics and finance. (Crosslisted course offered as ECONS 510, FIN 510). Required preparation must include college calculus and matrix algebra. Required preparation must include college calculus and matrix algebra.
- 511 Econometrics I** 3 Course Prerequisite: ECONS 510. Single equation linear and nonlinear models; estimation, inference, finite and asymptotic properties, effects and mitigation of violations of classical assumptions. (Crosslisted course offered as ECONS 511, FIN 511).
- 512 Econometrics II** 3 Course Prerequisite: ECONS 501; ECONS 511. Econometric methods for systems estimation; simultaneous equations, discrete and limited dependent variable, panel data, and time series data. (Crosslisted course offered as ECONS 512, FIN 512).
- 521 Interest Rates and Financial Markets** 3 Course Prerequisite: Admission to the MBA program. Real and nominal interest rates; bond pricing; term and risk structure of interest rates; investment and commercial banking; financial futures.
- 525 Advanced Financial Management** 3 Course Prerequisite: Admission to the MBA program. Theory of financial management; quantitative analysis of financial problems of the firm; empirical studies on financing modern corporations.
- 526 Financial Management** 3 Course Prerequisite: Admission to the MBA program. Advanced topics in corporate finance, including capital budgeting, cost of capital, capital structure, pay-out policy, and enterprise valuation.
- 527 Investment Analysis** 3 Course Prerequisite: Admission to the MBA program. A decision-making approach to the problems of asset management for personal and business portfolio.
- 528 Portfolio Theory and Financial Engineering** 3 Course Prerequisite: FIN 527; admission to the MBA program. The theory of portfolio management and the use of derivative securities in portfolio risk management.
- 581 International Finance** 3 Course Prerequisite: Admission to the MBA program. Principles of international finance; financial management of multinational corporations; international investments.

- 594 Theory of Industrial Organization** 3 Course Prerequisite: ECONS 502; ECONS 503; ECONS 511. Theory of market structure and firm behavior, including price and non-price competition, information and strategic behavior, and technological change. (Crosslisted course offered as ECONS 594, FIN 594).
- 595 Advanced Topics in Resource and Production Economics** V 1-6 May be repeated for credit; cumulative maximum 12 hours. Topics may include resource scarcity, decision making under risk, bioeconomics, production applications, welfare analysis.
- 596 Advanced Topics in Financial Economics** V 1-6 May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: Admission to PhD programs in business, or ECONS 500 and ECONS 501. Topics may include financial theory and empirical methods as applied to financial management, investments, international finance, and markets/institutions. (Crosslisted course offered as FIN 596, ECONS 596).
- 600 Special Projects or Independent Study** V 1-18 May be repeated for credit. Course Prerequisite: Admission to the MBA, Master of Accounting, or Business PhD programs. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 702 Master's Special Problems, Directed Study, and/or Examination** V 1-18 May be repeated for credit. Course Prerequisite: Admission to the MBA program. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.
- 800 Doctoral Research, Dissertation, and/or Examination** V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Business Administration - Finance PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.
- MANAGEMENT AND OPERATIONS**
- MGTOP**
- 215 Business Statistics** 4 (3-2) Course Prerequisite: MATH 201, 202, 171, or 172; MIS 250 or concurrent enrollment. Data presentation, probability, distributions, inferences, and linear regression as applied to business and economics.
- 340 Operations Management** 3 Course Prerequisite: MGTOP 215, STAT 212, STAT 360, or STAT 370; certified major (any college); junior standing. Management of operations, emphasizing production planning, inventory control, scheduling, forecasting, quality management, supply chain management, and facility layout and location.
- 412 [M] Data Analysis and Business Forecasting** 3 Course Prerequisite: Certified major or minor in the College of Business. Regression models, inference, residual analysis, time series modeling and forecasting as applied to business.
- 418 Quality Improvement for Management** 3 Course Prerequisite: MGTOP 215; certified major or minor in the College of Business. Total quality management as used in industries; philosophy of Deming and others, control charts, process capability analysis, team tools.
- 452 Supply Chain Management in the Digital Age** 3 Course Prerequisite: MGTOP 340; certified major or minor in the College of Business. Managing and modeling commercial supply chains, emphasizing electronic commerce, purchasing, supplier selection, logistics, global distribution networks, and supply chain coordination.
- 470 Business Modeling with Spreadsheets** 3 Course Prerequisite: MATH 202, 171, 172, or 140. Use of advanced spreadsheet tools and Visual Basic programming to build and analyze mathematical models of business problems.
- 496 Seminar** 3 May be repeated for credit. Course Prerequisite: Certified major or minor in the College of Business.
- 498 Internship** V 2-15 May be repeated for credit; cumulative maximum 15 hours. Course Prerequisite: By department permission. Cooperative educational internship with a business, government or non-profit organization. S, F grading.
- 499 Special Problems** V 1-4 May be repeated for credit. Course Prerequisite: By department permission. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 516 Time Series** 3 ARIMA models; identification, estimation, diagnostics, and forecasting; seasonal adjustments, outlier detection, intervention analysis and transfer function modeling. (Crosslisted course offered as MGTOP 516, STAT 516). Recommended preparation: STAT 443. Cooperative: Open to UI degree-seeking students.
- 519 Applied Multivariate Analysis** 3 Multivariate normal distribution, principal components, factor analysis, discriminant function, cluster analysis, Hotteling's T2 and MANOVA. (Crosslisted course offered as MGTOP 519, STAT 519). Recommended preparation: STAT 443.
- 540 Deterministic Business Models** 3 Decision analysis, linear optimization models, nonlinear models, network analysis including PERT, and dynamic programming as applied to business.
- 556 Advanced Business Modeling** 3 Course Prerequisite: Admission to the MBA program. Spreadsheet modeling and solution of business problems using mathematical programming; Monte Carlo simulation, queuing theory, and decision analysis.
- 581 Operations Management** 3 Course Prerequisite: Admission to the MBA program. Analytical approach to solving problems in production and operations management.
- 591 Statistical Analysis for Business Decisions** 3 Course Prerequisite: Admission to the MBA program. Analytical skills for decision-making; data collection and analysis, sampling, inferential, regression methodologies, experimental design, time series, forecasting analysis.
- 596 Doctoral Topics** V 1-4 May be repeated for credit; cumulative maximum 15 hours. Course Prerequisite: Admission to PhD programs in business. Advanced topics in management and operations.
- 597 Doctoral Topics** 3 May be repeated for credit; cumulative maximum 9 hours. Course Prerequisite: Admission to PhD programs in business. Advanced topics in management and operations.
- 598 Research and Professional Development** 1 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Admission to PhD programs in business. Ph.D.-level professional development colloquium designed to improve research, teaching, and presentation skills and to provide professional socialization. S, F grading.
- 600 Special Projects or Independent Study** V 1-18 May be repeated for credit. Course Prerequisite: Admission to the MBA, Master of Accounting, or Business PhD programs. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 702 Master's Special Problems, Directed Study, and/or Examination** V 1-18 May be repeated for credit. Course Prerequisite: Admission to the MBA program. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Business Administration - Operations and Management Science PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

The International Business Institute

**business.wsu.edu/internationalbusiness/
Todd Hall 570
509-335-2180**

Director, D. Sprott; International Business Fellows, S. Ahn, J. Callison, J. A. Cote, J. M. Cote, M. Featherman, S. Fotopoulos, D. Gursoy, J. Harbour, B. John-Mariadoss, J. Kim, G. Lai, V. Miskin, D. Muehling, J. Osiri, P. Tansuhaj, D. Whidbee, B. Wong-on-Wing.

The International Business Institute (IBI) was established to coordinate international activities in the College of Business. The IBI draws faculty, staff, and students together to achieve excellence in the internationalization of business education, research, and service. It administers the international business curriculum and advises all international business majors. The IBI aims at encouraging the business faculty, staff, and students to be involved in interesting and exciting activities in the global business.

Department of Management, Information Systems, and Entrepreneurship

**business.wsu.edu/academics/MISE/
Todd 442
509-335-5319**

Department Chair and Associate Professor, K. Butterfield; Director Center for Entrepreneurial Studies and Clinical Assistant Professor, M. Mayes; Professors, D. Compeau, J. Cullen, J. Goodstein (Vancouver), L. Hunter, K. D. Joshi, T. Tripp (Vancouver); Associate Professors, K. Kuhn, G. Rose (Vancouver), A. Sahaym, P. Skilton (Tri-Cities); Assistant Professors, T. Allison, R. Crossler, A. Lahiri, T. Saldanha, R. Saylor (Vancouver), L. Sheppard, J. Vithayathil, B. Warnick; Clinical Associate Professors, N. Ashley (Tri-Cities), J. Compeau, M. Featherman, K. Joshi; Clinical Assistant Professors, J. Bravo (Tri-Cities), M. Curry (Vancouver), V. Kolde, R. Moser; Instructor, M. Reed; Professor Emeritus, C. Morgan; Clinical Professor Emeritus, V. Miskin.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

ENTREPRENEURSHIP (120 HOURS)

Entrepreneurship is the recognition, creation, evaluation, and pursuit of opportunities for individual and social gains through the application of creativity and the securing of resources. The entrepreneurship major at WSU is not just for students who want to start a business. The major will help develop a broader mindset about innovation, risk-taking, and action that is valuable to students who work in large companies, non-profits, and new commercial or social ventures.

Graduation Requirements

A minimum cumulative GPA of 2.5 in all Carson College of Business (CCB) courses required for the major is required for graduation. The calculation will only count WSU business courses that are taught by the CCB including HBM courses. Economic Sciences courses or any other courses outside the college are not included.

Entrepreneurship majors are required to complete a minimum of 9 upper-division courses in residence. Students within the College of Business must complete an International Experience Requirement option, see catalog for more information.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] or SCIENCE 101 [SCI] ¹	3 or 4
ECONS 101 [SSCI] or 102 [SSCI]	3
ENGLISH 101 [WRITG]	3
Humanities [HUM]	3
MATH 201 ²	3

<i>Second Term</i>	<i>Hours</i>
ECONS 101 or 102	3
HISTORY 105 [ROOT]	3
MATH 202 [QUAN] ³	3
MIS 250	3
Physical Sciences [PSCI] or SCIENCE 102 [SCI] ¹	4 or 3

Second Year

<i>First Term</i>	<i>Hours</i>
ACCTG 230	3
Creative & Professional Arts [ARTS]	3
Diversity [DIVR]	3
SOC [SSCI] or PSYCH [SSCI] ⁴	3
Non-Business Electives ⁵	3

<i>Second Term</i>	<i>Hours</i>
ACCTG 231	3
B LAW 210	3
COM 102 [COMM] or H D 205 [COMM]	3 or 4
MGTOP 215 ⁶	4
POL S Elective	3
Complete Writing Portfolio	
Consider studying abroad this summer ⁷	

Third Year

<i>First Term</i>	<i>Hours</i>
FIN 325	3

I BUS 380	3
MGMT 301	3
MKTG 360	3
300-400-level Business Elective ⁸	3

<i>Second Term</i>	<i>Hours</i>
ENTRP 489	3
ENTRP 490	3
MGTOP 340	3
300-400-level Business Elective ⁸	3
Non-Business Electives ⁵	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
ENGLISH 402	3
ENTRP 426	3
ENTRP 485 [M] or 496 [M]	3
Non-Business Electives ⁵	6

<i>Second Term</i>	<i>Hours</i>
ENTRP 486 [M] or 496 [M]	3
ENTRP 492 [CAPS]	3
300-400-level Business Elective (MIS 441 recommended) ⁸	3
Non-Business Electives ⁵	4

¹ For a total of 7 credits—one Biological Science [BSCI] and one Physical Science [PSCI] course, including one lab course, or 8 credits of [SCI] designated courses. (SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI], which is offered Spring semester.)

² MATH 201 will be waived with the completion of MATH 202 or equivalent.

³ Alternative to MATH 202 is MATH 171, 140 or 206.

⁴ Required for the major.

⁵ Non-Business courses to equal 60 credit hours.

⁶ MATH/STAT 212 will be accepted as alternative to MGTOP 215 for transfer students.

⁷ All students must complete the International Experience Requirement. Options for completing the requirement can be found in the Carson College of Business Academic Unit section of the catalog under Business. Students should consult with their advisor to determine the best option.

⁸ May not include courses from the business administration core, the set of required ENTRP courses, or any 498 or 499 courses.

MANAGEMENT (120 HOURS)

The Management major has been developed for students interested in pursuing a career as a professional manager. In addition to learning vital management skills such as planning, organizing, leadership, and controlling, students will gain marketable skills by choosing one of two tracks. The Human Resource Management (HRM) track provides skills in areas such as selection, training, motivating, evaluating, and compensating employees. The Innovation and Change (I&C) track provides skills in areas such as managing innovation in networks and teams and managing organizational change processes.

Graduation Requirements

A minimum cumulative GPA of 2.5 in all Carson College of Business (CCB) courses required for the major is required for graduation. The calculation will only count WSU business courses that are taught by

the CCB including HBM courses. Economic Sciences courses or any other courses outside the college are not included.

Management majors are required to complete a minimum of 9 upper-division business courses in residence. Students within the College of Business must complete an International Experience Requirement option, see catalog for more information.

First Year

First Term	Hours
Biological Sciences [BSCI] or SCIENCE 101 [SCI] ¹	3 or 4
ECONS 101 [SSCI] or 102 [SSCI]	3
ENGLISH 101 [WRTG]	3
Humanities [HUM]	3
MATH 201 ²	3

Second Term	Hours
ECONS 101 or 102	3
HISTORY 105 [ROOT]	3
MATH 202 [QUAN] ³	3
MIS 250	3
Physical Sciences [PSCI] or SCIENCE 102 [SCI] ¹	4 or 3

Second Year

First Term	Hours
ACCTG 230	3
Creative & Professional Arts [ARTS]	3
Diversity [DIVR]	3
SOC [SSCI] or PSYCH [SSCI] ⁴	3
Non-Business Electives ⁵	3

Second Term	Hours
ACCTG 231	3
B LAW 210	3
COM 102 [COMM] or H D 205 [COMM]	3 or 4
MGTOP 215 ⁶	4
POL S Elective	3
Complete Writing Portfolio	
Consider studying abroad this summer ⁷	

Third Year

First Term	Hours
FIN 325	3
I BUS 380	3
MGMT 301	3
MGTOP 340	3
MKTG 360	3

Second Term	Hours
MGMT 401 [M]	3
MGMT 483 [M] (I&C Track) or MGMT 450 (HRM Track)	3
MGMT 487	3
MGMT (I&C) or (HRM) Track Electives ⁸	3
Non-Business Electives ⁵	3

Fourth Year

First Term	Hours
300-400-level Business Elective ⁹	3
ENGLISH 402 or 403	3
MGMT 456 (HRM Track) or ENTRP 489 (I&C Track)	3
Non-Business Electives ⁵	6

Second Term	Hours
300-400-level Business Elective ⁹	3
MGMT 491 [CAPS] or ENTRP 492 [CAPS]	3

Non-Business Electives⁵ 7

¹ For a total of 7 credits—one Biological Science [BSCI] and one Physical Science [PSCI] course, including one lab course, or 8 credits of [SCI] designated courses. (SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI], which is offered Spring semester.)

² MATH 201 will be waived with the completion of MATH 202 or equivalent.

³ Alternative to MATH 202 is MATH 171, 140 or 206.

⁴ Required for the major.

⁵ Non-Business courses to equal 60 credit hours.

⁶ MATH/STAT 212 will be accepted as alternative to MGTOP 215 for transfer students.

⁷ All students must complete the International Experience Requirement. Options for completing the requirement can be found in the Carson College of Business Academic Unit section of the catalog under Business. Students should consult with their advisor to determine the best option.

⁸ Human Resource Management (HRM) track electives include MGMT 455 [M], 485, and 496. Innovation and Change (I&C) track electives include MIS 420, 441, MGTOP 470, and MGMT 496.

⁹ May not include courses from the business administration core, the set of required MGMT/MGTOP courses, or any 498 or 499 courses.

MANAGEMENT INFORMATION SYSTEMS (120 HOURS)

Preparation for careers in every field of business, using information systems technology to solve business problems. Provides excellent training in systems design, development, networking, and support to meet the demands of this fast-growing occupational area.

Graduation Requirements

A minimum cumulative GPA of 2.5 in all Carson College of Business (CCB) courses required for the major is required for graduation. The calculation will only count WSU business courses that are taught by the CCB including HBM courses. Economic Sciences courses or any other courses outside the college are not included.

Management Information System majors are required to complete a minimum of 9 upper-division business courses in residence. Students within the College of Business must complete an International Experience Requirement option, see catalog for more information.

First Year

First Term	Hours
Biological Sciences [BSCI] or SCIENCE 101 [SCI] ¹	3 or 4
ECONS 101 [SSCI] or 102 [SSCI]	3
HISTORY 105 [ROOT]	3
Humanities [HUM]	3
MATH 201 ²	3

Second Term	Hours
ECONS 101 or 102	3
ENGLISH 101 [WRTG]	3
MATH 202 [QUAN] ³	3
MIS 250	3
Physical Sciences [PSCI] or SCIENCE 102 [SCI] ¹	4 or 3

Second Year

First Term	Hours
ACCTG 230	3
Creative & Professional Arts [ARTS]	3
Diversity [DIVR]	3
SOC [SSCI] or PSYCH [SSCI] ⁴	3
Non-Business Electives ⁵	3

Second Term	Hours
ACCTG 231	3
B LAW 210	3
COM 102 [COMM] or H D 205 [COMM]	3 or 4
MGTOP 215 ⁶	4
MIS 271 or Elective	3
Complete Writing Portfolio	
Consider studying abroad this summer ⁷	

Third Year

First Term	Hours
FIN 325	3
MGMT 301	3
MIS 271 or 300-400-level MIS Electives ⁸	3
MIS 322 [M]	3
MIS 325	3

Second Term	Hours
I BUS 380	3
MGTOP 340	3
MIS 372 [M]	3
MKTG 360	3
300-400-level MIS Elective ⁸	3

Fourth Year

First Term	Hours
ENGLISH 402	3
MGMT 491 [CAPS] or ENTRP 492 [CAPS]	3
300-400-level Business Electives ⁹	6
Non-Business Electives ⁵	3

Second Term	Hours
POL S Elective	3
300-400-level Electives ⁹	3
Non-Business Electives ⁵	7

¹ For a total of 7 credits—one Biological Science [BSCI] and one Physical Science [PSCI] course, including one lab course, or 8 credits of [SCI] designated courses. (SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI], which is offered Spring semester.)

² MATH 201 will be waived with the completion of MATH 202 or equivalent.

³ Alternative to MATH 202 is MATH 171, 140 or 206.

⁴ Required for the major.

⁵ Non-Business courses to equal 60 credit hours.

⁶ MATH/STAT 212 will be accepted as alternative to MGTOP 215 for transfer students.

⁷ All students must complete the International Experience Requirement. Options for completing the requirement can be found in the Carson College of Business Academic Unit section of the catalog under Business. Students should consult with their advisor to determine the best option.

⁸ Any MIS course except 498 or 499 not used to fulfill major requirements.

⁹ Admissible 300-400-level courses may not include courses from the business administration core, the set of required MIS courses, or any 498 or 499 courses.

Minors

Entrepreneurship

To be eligible to certify for an Entrepreneurship minor, students must be certified in a major and have a cumulative GPA of 2.5 or higher. The Entrepreneurship minor requires 18 credits of course work including ACCTG 230 and ENTRP 426, one management course: ENTRP 489, ENGR 401, or an approved substitute, one Marketing/Communication course: ENTRP 490, COMSTRAT 380, or an approved substitute, and two Business plan courses (minimum 6 credits) over two semesters: ENTRP 485/486, ENTRP 496/496, BIO ENG 410/411, or approved substitutes. Students must maintain a minimum cumulative GPA of 2.5 in the entrepreneurship minor courses. A minimum of 9 upper division credits must be taken in residence at WSU or through WSU-approved education abroad or educational exchange course. Application for the minor must be completed online at www.business.wsu.edu/advising.

Human Resource Management

To be eligible to certify for a minor in Human Resource Management (HRM), students must be certified in a major and have a cumulative GPA of 2.5 or higher. The minor in Human Resource Management requires 19 credits of course work, including MGTOP 215 or PSYCH 311, MGMT 301, MGMT 450, and either HD 205 or MIS 250, and two upper division human resource management courses (6 credits) from MGMT 455, MGMT 456, or MGMT 496. Students must maintain a cumulative GPA of at least 2.5 in the HRM minor courses. A minimum of 9 credits upper division coursework must be taken in residence at WSU or through WSU-approved education abroad or educational exchange course.

Description of Courses

ENTREPRENEURSHIP

ENTRP

- 426 Entrepreneurial Finance** 3 Course
Prerequisite: Certified major or minor in the College of Business. Raising capital for new enterprises; venture capital, IPOs, debt financing, leasing and valuing start-up ventures.
- 485 [M] New Venture Planning** 3 Course
Prerequisite: Certified major or minor in the College of Business. Skills, behaviors, and knowledge necessary for creating and growing new ventures; evaluating opportunities, developing growth strategies, obtaining venture financing, intellectual property, and building a management team.
- 486 [M] Launching New Ventures** 3 Course
Prerequisite: ENTRP 485; certified major or minor in the College of Business. Focus on turning an idea into a serious business venture; research new business opportunities and become skilled in developing business tools and processes to carry out venture-launch strategies; compete in the WSU Business Plan Competition.

489 Entrepreneurial Management 3 Course
Prerequisite: Certified major or minor in the College of Business. Philosophy and nature of entrepreneurship for all business organizations; analytical, financial and interpersonal entrepreneurial skills.

490 [M] Entrepreneurial Marketing 3 Course
Prerequisite: Certified major or minor in the College of Business. Concepts, issues, and techniques of marketing in entrepreneurial ventures and the role of entrepreneurship in marketing efforts of all firms.

492 [CAPS] Small Business Strategy and Planning 3 Course
Prerequisite: FIN 325; MGMT 301; MKTG 360; certified major or minor in the College of Business. Application of management theory and principles to small firms; applied consulting experience with operating businesses.

496 [M] Special Topics V 1-3 May be repeated for credit; cumulative maximum 6 hours. Course
Prerequisite: Certified major or minor in the College of Business. Course covers new or time-sensitive topics in entrepreneurship.

498 Entrepreneurship Internship V 2-15 May be repeated for credit; cumulative maximum 15 hours. Course
Prerequisite: By department permission. Cooperative educational internship with a business, government, or nonprofit organization. S, F grading.

499 Special Problems V 1-4 May be repeated for credit. Course
Prerequisite: By department permission. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.

501 Technology Entrepreneurship 3 Course
Prerequisite: Admission to the MBA program. Basic business concepts and processes applied to technology commercialization and venture creation.

588 (MGTOP) Management of Innovation 3 Course
Prerequisite: Admission to the MBA program. Technological transitions and technology strategy; knowledge and creativity in organizations; managing innovation processes, technical employees, and cross-functional cooperation. (Crosslisted course offered as MGMT 588, ENTRP 588).

600 Special Projects or Independent Study V 1-18 May be repeated for credit. Course
Prerequisite: Admission to the MBA program. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.

MANAGEMENT

MGMT

101 Introduction to Business 3 Enrollment not allowed if credit for MGMT 301 or MKTG 360 already earned. Introduction to the practice of business with explanations of business environments, strategy, organization, functional areas, terminology, processes, tasks and ethics. Credit not allowed for MGMT 101 if credit already earned in MGMT 301 and/or MKTG 360.

301 Principles of Management and Organization 3 Course
Prerequisite: Certified major [any college] with 60 semester hours. Principles of management and administration aimed at improving effectiveness of all types of organizations. Credit not allowed for MGMT 101 if credit already earned in MGMT 101.

315 Women in Management and Leadership 3 Analysis of women's historical and contemporary role in American management.

401 [M] Leading People and Organizations 3 Course
Prerequisite: MGMT 301; certified major or minor in the College of Business, or option of Personnel Psychology & Human Resource Management. Leadership, motivation, team building, group dynamics, interpersonal and group conflict, and job design.

450 Personnel and Human Resources Management 3 Course
Prerequisite: MGTOP 215 or PSYCH 311; MGMT 301; certified major or minor in the College of Business, or option of Personnel Psychology & Human Resource Management. Policy and practice in human resource utilization, selecting, training, motivating, evaluating, and compensating employees; labor relations; EEO legislation.

455 Recruiting and Hiring Human Capital 3 Course
Prerequisite: MGMT 450; certified major or minor in the College of Business, or option of Personnel Psychology & Human Resource Management. Selection issues; methods of forecasting, planning, recruitment, selection; analysis of psychometric properties of tests; techniques for assessing reliability and validity.

456 [M] Evaluating and Rewarding Employees 3 Course
Prerequisite: MGMT 450; certified major or minor in the College of Business, or option of Personnel Psychology & Human Resource Management. Theoretical, research, and applied issues related to the compensation of employees.

483 [M] Management of Innovation and Change 3 Course
Prerequisite: MGMT 301; certified major or minor in the College of Business, or option of Personnel Psychology & Human Resource Management. Analysis of innovation and change theories in organizations; managing innovation in networks and teams; technology, structure, culture, and environment.

- 485 [M] Negotiation Skills** 3 Course Prerequisite: Certified major or minor in the College of Business, or option of Personnel Psychology & Human Resource Management. Bargaining skills across a broad range of business settings; experiential work.
- 487 Business Ethics and Corporate Responsibility** 3 Course Prerequisite: MGMT 301; certified major or minor in the College of Business, or option of Personnel Psychology & Human Resource Management. The nature and sources of individual and corporate ethical responsibilities in the business context and ways of addressing conflicting responsibilities.
- 491 [CAPS] Strategic Management** 3 Course Prerequisite: MGTOP 340; FIN 325; MGMT 301; MIS 250; MKTG 360; certified major or minor in the College of Business. Capstone course integrating diverse functional knowledge for strategy formulation, implementation and competitive advantage from the perspective of top management.
- 496 Seminar** 3 May be repeated for credit. Course Prerequisite: Certified major or minor in the College of Business, or option of Personnel Psychology & Human Resource Management.
- 498 Internship** V 2-15 May be repeated for credit; cumulative maximum 15 hours. Course Prerequisite: By department permission. Cooperative educational internship with a business, government or non-profit organization. S, F grading.
- 499 Special Problems** V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 582 (MGTOP) Personnel and Human Resource Management** 3 Course Prerequisite: Admission to the MBA program. Human resources and personnel administration; selection, training, compensation, performance appraisal, labor relations, health and safety, EEO legislation.
- 584 Seminar in Entrepreneurship** 3 Course Prerequisite: Admission to the Ph.D. in Business Administration. Advanced, doctoral-level topics in entrepreneurship.
- 585 Advanced Negotiation Skills** 3 Course Prerequisite: Admission to the Master of Accounting program, MBA program, Master of Public Affairs (MPA) program, or Business Ph.D. programs. Bargaining skills in multi-stakeholder settings; experiential work.
- 587 (MGTOP) Professional Ethics and Practice in Business** 3 Course Prerequisite: Admission to the MBA program. Ethical issues faced by businesses in the current environment; traditional sources for discerning professional and ethical practices.
- 588 (MGTOP) Management of Innovation** 3 Course Prerequisite: Admission to the MBA program. Technological transitions and technology strategy; knowledge and creativity in organizations; managing innovation processes, technical employees, and cross-functional cooperation. (Crosslisted course offered as MGMT 588, ENTRP 588).
- 589 (MGTOP) Seminar in Management** 3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Admission to the MBA program. Special topics in management, organization behavior, organization theory, human resource management and strategic management.
- 590 (MGTOP) Strategy Formulation and Organizational Design** 3 Course Prerequisite: Admission to the MBA program. Relationship between the formulation of strategy and the selection of effective organizational structures and systems.
- 593 (MGTOP) Managerial Leadership and Productivity** 3 Course Prerequisite: Admission to the MBA program. Organizational behavior and human motivation in the workplace; organization and leadership theories, studies, projects and models leading to improved productivity.
- 594 Seminar in Organizational Theory** 3 Course Prerequisite: Admission to the Ph.D. in Business Administration. Advanced, doctoral-level topics in organizational theory.
- 595 Seminar in Strategic Management** 3 Course Prerequisite: Admission to the Ph.D. in Business Administration. Advanced, doctoral-level topics in Strategic Management.
- 597 Seminar in International Management** 3 Course Prerequisite: Admission to the Ph.D. in Business Administration. Advanced, doctoral-level topics in International Management.
- 599 Seminar in Management (Organizational Behavior)** 3 Course Prerequisite: Admission to PhD programs in business. Advanced doctoral-level topics in organizational behavior.
- 600 Special Projects or Independent Study** V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 702 Master's Special Problems, Directed Study, and/or Examination** V 1-18 May be repeated for credit. Course Prerequisite: Admission to the MBA program. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.
- 800 Doctoral Research, Dissertation, and/or Examination** V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Business Administration - Management PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

MANAGEMENT INFORMATION SYSTEMS

MIS

- 171 Web Technologies and Innovation** 3 Effects of web-based technologies and modern development environments on organizations.
- 250 Managing Information Technology** 3 (2-2) Comprehensive overview of the role of management information systems in business, principles and application of MIS, and hands-on computer labs.
- 271 Business Systems Development** 3 Top-down program design, structured development techniques, and system testing.
- 322 [M] Enterprise Business Process Analysis** 3 Course Prerequisite: MIS 250; certified major or minor in the College of Business, or certified major in Data Analytics. The role of the systems analyst, and the application of systems analysis and design techniques in information systems development.
- 325 Enterprise Business Development** 3 Course Prerequisite: MIS 250; certified major or minor in the College of Business. Basic principles of designing and developing enterprise-level business applications.
- 372 [M] Data Management** 3 Course Prerequisite: MIS 322; certified major or minor in the College of Business, or certified major in Data Analytics. The management of data in business environments.
- 374 Information Technology Infrastructure and Security** 3 Course Prerequisite: MIS 250; certified major or minor in the College of Business. Designing, managing, and securing corporate information technology infrastructures.
- 420 Business Intelligence** 3 Course Prerequisite: MIS 250; certified major or minor in the College of Business, or certified major in Data Analytics. Fundamentals of using information systems for business intelligence and decision support.
- 426 Emerging Technologies** 3 May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: MIS 250; certified major or minor in the College of Business. Special and advanced topics in MIS.
- 441 Global E-Commerce** 3 Course Prerequisite: MIS 250; certified major or minor in the College of Business. Capabilities of the Internet to support and enable global electronic commerce; effective design and implementation; managerial issues.

448 Global IS Project Management 3 Course
Prerequisite: Certified major or minor in the College of Business. Principles and techniques related to managing information systems projects in global business environments.

498 Management Information Systems Internship V 2-15 May be repeated for credit. Course Prerequisite: By department permission. Cooperative educational internship with a business, government or nonprofit organization. S, F grading.

499 Special Problems V 1-4 May be repeated for credit. Course Prerequisite: By department permission. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.

557 Designing Business Intelligence Systems 3 Course Prerequisite: Admission to the MBA program. Design and use of business intelligence systems, and business performance analytics.

572 Database Management Systems 3 Course Prerequisite: Admission to the MBA, Master of Accounting, or Business PhD programs. Database management, data modeling, system design and implementation; the application of DBMS technologies to organizational and business problems.

574 Telecommunications and Networking in Business 3 Course Prerequisite: Admission to the MBA, Master of Accounting, or Business PhD programs. Business applications of data communications, infrastructure, protocols, topologies and management, the design of wired and wireless solutions, and related research issues.

575 Electronic Commerce and the Internet 3 Course Prerequisite: Admission to the MBA, Master of Accounting, or Business PhD programs. Technologies underlying electronic commerce and the internet; strategies and implementation plans for managing the implementation of electronic commerce systems.

576 Emerging Technologies 3 Course Prerequisite: Admission to the MBA, Master of Accounting, or Business PhD programs. Special and advanced topics in MIS.

580 Information Systems Management 3 Course Prerequisite: Admission to the MBA program. Data processing organization; operations, application development, computer selection, management of computer personnel and systems.

582 Systems Analysis and Design 3 Course Prerequisite: Admission to the MBA, Master of Accounting, or Business PhD programs. Research on and application of systems analysis, design, development and management of information systems; systems development life cycle.

595 MIS Research Foundations 3 Course Prerequisite: Admission to PhD programs in business. Seminal works in MIS, philosophy of science and theory development.

596 Doctoral Topics 3 May be repeated for credit; cumulative maximum 9 hours. Course Prerequisite: Admission to PhD programs in business. Advanced topics in management information systems.

597 MIS Research Methods 3 Course Prerequisite: Admission to PhD programs in business. Study and application of research methods used in MIS research.

598 MIS Research Topics 3 Course Prerequisite: Admission to PhD programs in business. Major streams of research in MIS.

599 MIS Research Proposal Development 3 Course Prerequisite: Admission to PhD programs in business. Seminar on the process of creating a MIS research proposal.

600 Special Projects or Independent Study V 1-18 May be repeated for credit. Course Prerequisite: Admission to the MBA, Master of Accounting, or Business PhD programs. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Business Administration - Information Systems PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Department of Marketing and International Business

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Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

INTERNATIONAL BUSINESS (120 HOURS)

Preparation for careers with multinational corporations, governmental and intergovernmental agencies both domestic and international. Students

must complete 9 credits of foreign study except for students studying at WSU who reside outside the US and who attended at least one year of secondary school in a foreign country. One year of foreign language is required except for non-native speakers of English from outside the US who may substitute satisfactory TOEFL scores. Bilingual Americans may substitute satisfactory ETS scores or certification by a WSU faculty member who is a native speaker of the target language.

Graduation Requirements

A minimum cumulative GPA of 2.5 in all Carson College of Business (CCB) courses required for the major is required for graduation. The calculation will only count WSU business courses that are taught by the CCB including HBM courses. Economic Sciences courses or any other courses outside the college are not included.

International Business majors are required to complete a minimum of 9 upper-division business courses in residence. Students within the College of Business must complete an International Experience Requirement option, see catalog for more information.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] or SCIENCE 101 [SCI] ¹	3 or 4
ECONS 101 [SSCI] or 102 [SSCI]	3
HISTORY 105 [ROOT]	3
Humanities [HUM]	3
MATH 201 ²	3

<i>Second Term</i>	<i>Hours</i>
ECONS 101 or 102	3
ENGLISH 101 [WRITG]	3
MATH 202 [QUAN] ³	3
MIS 250	3
Physical Sciences [PSCI] or SCIENCE 102 [SCI] ¹	4 or 3

Second Year

<i>First Term</i>	<i>Hours</i>
ACCTG 230	3
Creative & Professional Arts [ARTS]	3
Diversity [DIVR]	3
SOC [SSCI] or PSYCH [SSCI] ⁴	3
Non-Business Electives ⁵	2

<i>Second Term</i>	<i>Hours</i>
ACCTG 231	3
B LAW 210	3
COM 102 [COMM] or H D 205 [COMM]	3 or 4
MGTOP 215 ⁶	4
POL S Elective	3
Complete Writing Portfolio	
Consider studying abroad this summer ⁷	

Third Year

<i>First Term</i>	<i>Hours</i>
Foreign Language ⁸	4
Study Abroad ⁹	9
300-400-level I BUS Elective ^{10, 11}	3

<i>Second Term</i>	<i>Hours</i>
FIN 325	3
I BUS 380	3
MGMT 301	3
MKTG 360	3
300-400-level Business Electives ¹²	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
Foreign Language ⁸	4
I BUS 415 [M]	3
MGTOP 340	3
Non-Business Electives ⁵	3
<i>Second Term</i>	<i>Hours</i>
ECONS 327, 427, or I BUS 470	3
ENGLISH 402	3
MGMT 491 [CAPS] or ENTRP 492 [CAPS]	3
300-400-level Business Electives ¹²	3
300-400-level I BUS Elective ^{10, 11}	3

¹ For a total of 7 credits—one Biological Science [BSCI] and one Physical Science [PSCI] course, including one lab course, or 8 credits of [SCI] designated courses. (SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI], which is offered Spring semester.)

² MATH 201 will be waived with the completion of MATH 202 or equivalent.

³ Alternative to MATH 202 is MATH 171, 140 or 206.

⁴ Required for the major.

⁵ Non-Business courses to equal 60 credit hours.

⁶ MATH/STAT 212 will be accepted as alternative to MGTOP 215 for transfer students.

⁷ All students must complete the International Experience Requirement. Options for completing the requirement can be found in the Carson College of Business Academic Unit section of the catalog under Business. Students should consult with their advisor to determine the best option.

⁸ One year of Foreign language beyond high school level. May be taken as part of study abroad. Non native English speakers and bilingual students should check with department regarding this requirement.

⁹ Study Abroad coursework may also be taken during summer.

¹⁰ May be taken as part of study abroad.

¹¹ I BUS Electives must include one [M] course. Approved electives are: ACCTG 420, ECONS 327/ I BUS 470, ENTRP 492, FIN 481 [M], I BUS 416 [M], 435, 453 [M], 482 [M], 496, and MIS 441.

¹² May not include courses from the business administration core, the set of required I BUS courses, or any 498 or 499 courses.

**MARKETING
(120 HOURS)**

Preparation for careers in marketing management, sales, retail management, marketing research, brand management, and promotion.

Graduation Requirements

A minimum cumulative GPA of 2.5 in all Carson College of Business (CCB) courses required for the major is required for graduation. The calculation will only count WSU business courses that are taught by the CCB including HBM courses. Economic Sciences courses or any other courses outside the college are not included.

Marketing majors are required to complete a minimum of 9 upper-division business courses in residence. Students within the College of Business must complete an International Experience Requirement option, see catalog for more information.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] or SCIENCE 101 [SCI] ¹	3 or 4
ECONS 101 [SSCI] or 102 [SSCI]	3
HISTORY 105 [ROOT]	3
Humanities [HUM]	3
MATH 201 ²	3
<i>Second Term</i>	<i>Hours</i>
ECONS 101 or 102	3
ENGLISH 101 [WRTG]	3
MATH 202 [QUAN] ³	3
MIS 250	3
Physical Sciences [PSCI] or SCIENCE 102 [SCI] ¹	4 or 3

Second Year

<i>First Term</i>	<i>Hours</i>
ACCTG 230	3
Creative & Professional Arts [ARTS]	3
Diversity [DIVR]	3
SOC [SSCI] or PSYCH [SSCI] ⁴	3
Non-Business Electives ⁵	3

<i>Second Term</i>	<i>Hours</i>
ACCTG 231	3
B LAW 210	3
COM 102 [COMM] or H D 205 [COMM]	3 or 4
MGTOP 215 ⁶	4
POL S Elective	3
Complete Writing Portfolio	
Consider studying abroad this summer ⁷	

Third Year

<i>First Term</i>	<i>Hours</i>
FIN 325	3
I BUS 380	3
MGMT 301	3
MGTOP 340	3
MKTG 360	3

<i>Second Term</i>	<i>Hours</i>
ENGLISH 402	3
MKTG 407	3
300-400-level Business Electives ⁸	3
300-400-level MKTG Elective ⁹	3
Non-Business Electives ⁵	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
MKTG 368	3
300-400-level Business Electives ⁸	3
300-400-level MKTG Elective ⁹	3
Non-Business Electives ⁵	6

<i>Second Term</i>	<i>Hours</i>
MGMT 491 [CAPS] or ENTRP 492 [CAPS]	3
MKTG 495 [M]	3
Non-Business Electives ⁵	7

¹ For a total of 7 credits—one Biological Science [BSCI] and one Physical Science [PSCI] course, including one lab course, or 8 credits of [SCI] designated courses. (SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI], which is offered Spring semester.)

² MATH 201 will be waived with the completion of MATH 202 or equivalent.

³ Alternative to MATH 202 is MATH 171, 140 or 206.

⁴ Required for the major.

⁵ Non-Business courses to equal 60 credit hours.

⁶ MATH/STAT 212 will be accepted as alternative to MGTOP 215 for transfer students.

⁷ All students must complete the International Experience Requirement. Options for completing the requirement can be found in the Carson College of Business Academic Unit section of the catalog under Business. Students should consult with their advisor to determine the best option.

⁸ May not include courses from the business administration core, the set of required MKTG courses, or any 498 or 499 courses.

⁹ Any 300-400 level MKTG course not used to fulfill major requirements, ENTRP 490[M] or IBUS 482[M]. Must include one [M] course.

Description of Courses**INTERNATIONAL BUSINESS****I BUS**

380 International Business 3 Course
Prerequisite: Certified major or minor in the College of Business. International political economy; business relationships between nations; corporations and economic institutions.

399 Foreign Study V 1-15 May be repeated for credit; cumulative maximum 15 hours. Course Prerequisite: By permission only. Participation in approved programs of study at a foreign educational institution. S, F grading.

415 [M] Law of International Trade 3 Course
Prerequisite: B LAW 210; certified major or minor in the College of Business. Legal organization of the international community; international aspects of trade and development, economic cooperation, and technical, social, and cultural cooperation.

416 [M] Public International Law 3 Course
Prerequisite: B LAW 210; certified major or minor in the College of Business. Law governing states, intergovernmental organizations, and nongovernmental organizations (including multinational enterprises); human rights law; environmental law; and dispute settlement.

435 International Tourism 3 Course
Prerequisite: Certified major or minor in the College of Business, or option of Personnel Psychology & Human Resource Management. International and domestic tourism; effects of tourism on the society.

453 [M] International Management 3 Course
Prerequisite: Certified major or minor in the College of Business. Cross-cultural implications of management theories and approaches; the role of national culture in management theory and practice.

470 International Trade and Finance 3 Course
Prerequisite: ECONS 101 or 198; ECONS 102 or 198. Analysis and description of international trade flows; commercial policy; multinational firms, foreign exchange markets; open economy macroeconomics; international monetary systems. (Crosslisted course offered as ECONS 327, I BUS 470).

- 482 [M] International Marketing 3** Course Prerequisite: MKTG 360; certified major or minor in the College of Business. Opportunities, characteristics, trends in foreign markets; alternative methods; strategies; organizational planning, control; problems of adapting American marketing concepts and methods.
- 496 Special Topics V 1-3** May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Certified major or minor in the College of Business.
- 498 International Business Internship V 2-15** May be repeated for credit; cumulative maximum 15 hours. Course Prerequisite: By department permission. Cooperative educational internship with a business, government or non-profit organization. S, F grading.
- 499 Special Problems V 1-4** May be repeated for credit. Course Prerequisite: By department permission. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 580 International Business Management 3** Course Prerequisite: Admission to the MBA program. Decision making in the international environment; political, cultural, and economic risk management.
- 582 International Marketing Management 3** Course Prerequisite: Admission to the MBA program. Principles of international marketing, marketing decision making in international environments, problems of adapting marketing programs to international markets.
- 600 Special Projects or Independent Study V 1-18** May be repeated for credit. Course Prerequisite: Admission to the MBA program. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- MARKETING**
- MKTG**
- 279 [COMM] Professional Persuasive Communications 3** Basic psychological principles of influence and the development of persuasive professional communication skills for career advancement and as life skills.
- 360 Marketing 3** Course Prerequisite: Certified major [any college] with 60 semester hours. An introduction to the marketing process and the strategic managerial decisions that are made with regard to product, price, promotion, and distribution. Credit not allowed for MGMT 101 if credit already earned in MKTG 360.
- 368 Marketing Research 3** Course Prerequisite: MKTG 360; certified major or minor in the College of Business. Use of secondary and primary data to facilitate marketing managers' decision-making capabilities; applied marketing research techniques including focus groups, surveys, experiments and statistical analyses; preparation of marketing research reports.
- 379 Professional Sales 3** Course Prerequisite: Certified major or minor in the College of Business. Theory, principles, and practices of professional sales with special attention to the business-to-business market.
- 407 Consumer Behavior 3** Course Prerequisite: MKTG 360; certified major or minor in the College of Business. Investigation of social processes affecting consumer decision-making and behavior; models of consumer behavior are covered, as are the psychological phenomena of learning, motivation, and attitude development, and the sociological influences of social class, reference groups and culture.
- 450 Internet Marketing 3** Course Prerequisite: MKTG 360; certified major or minor in the College of Business. An examination of marketing's role in the Internet and electronic commerce.
- 461 [M] Product Management 3** Course Prerequisite: MKTG 360; certified major or minor in the College of Business. Management of existing products and product lines, and design, development, pricing and marketing of new products in the firm.
- 468 Public Policy and Marketing 3** Course Prerequisite: MKTG 360; certified major or minor in the College of Business. The use of marketing principles and techniques to benefit society; the importance of marketing as it relates to government regulation of marketing structure, consumer protection, and consumer welfare.
- 470 Retail Management 3** Course Prerequisite: MKTG 360; certified major or minor in the College of Business. Retailing system; organization, merchandising models, pricing, promotion, location, and control procedures; management decision processes.
- 477 Promotion Management 3** Course Prerequisite: MKTG 360; certified major or minor in the College of Business. An overview of the managerial approaches and theoretical perspectives relevant to planning, implementing, and evaluating integrated marketing communications strategies.
- 478 [M] Sales Management 3** Course Prerequisite: MKTG 360; certified major or minor in the College of Business. Sales management strategies and plans to achieve a firm's marketing objectives, including the hiring, firing, training, motivation, compensation, deployment, and evaluation of sales personnel.
- 480 Business to Business Marketing 3** Course Prerequisite: MKTG 360; certified major or minor in the College of Business. Marketing strategies for creating customer and firm value in business-to-business markets.
- 487 Independent Research 3** Course Prerequisite: Certified major or minor in the College of Business. Independent research project with faculty member including problem statement, literature review, hypotheses, data collection, and reporting of results.
- 495 [M] Marketing Management 3** Course Prerequisite: MKTG 360; certified major or minor in the College of Business Administration; senior standing. Integrative marketing capstone course; the evaluation and design of marketing strategy; covers industry, competitor, and customer analysis with the goal of recommending and implementing an appropriate marketing strategy.
- 496 Special Topics V 1-3** May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: MKTG 360; certified major or minor in the College of Business. May be repeated for credit; cumulative maximum 6 hours.
- 498 Marketing Internship V 2-15** May be repeated for credit; cumulative maximum 15 hours. Course Prerequisite: MKTG 360; certified major or minor in the College of Business. Cooperative educational internship with a business, government or nonprofit organization. S, F grading.
- 499 Special Problems V 1-4** May be repeated for credit. Course Prerequisite: MKTG 360; certified major or minor in the College of Business. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 505 Survey of Marketing 3** Course Prerequisite: Admission to the MBA, Master of Accounting, or Business PhD programs. Marketing management; relevance of marketing to company profitability and consumer satisfaction; decision regarding price, product, promotion, and distribution.
- 506 Marketing Strategy 3** Course Prerequisite: Admission to the MBA program. Marketing analyses needed to recommend and implement a marketing strategy. Includes coverage of industry, competitor, and customer analysis as well as decision factors related to segmentation, positioning, and the marketing mix.
- 507 Consumer Behavior 3** Course Prerequisite: Admission to the MBA program. Marketing structure and behavior from economic and behavioral perspectives; social evaluation and behavioral implications of marketing strategy.
- 555 Marketing Analytics 3** Course Prerequisite: Admission to the MBA program. Development of marketing analytics skills utilizing large data sets to identify marketing and consumer trends in online and offline markets.
- 561 New Product Marketing 3** Course Prerequisite: Admission to the MBA program. Introduction of new products that are based on new technology; exploration of actual products in the market.

565 Seminar in Marketing 3 May be repeated for credit; cumulative maximum 9 hours. Course Prerequisite: Admission to the MBA, Master of Accounting, or Business PhD programs. Marketing structure and behavior from economic and behavioral perspectives; social evaluation and behavioral implications of marketing strategy.

577 Promotional Management 3 Course Prerequisite: Admission to the MBA program. Integrated promotion into the marketing plan; methods, organization, communications, media selection, and campaigns.

590 Seminar in Consumer Behavior 3 Course Prerequisite: Admission to PhD programs in business. Advanced, doctoral-level topics in consumer behavior.

591 Seminar in Marketing Management 3 Course Prerequisite: Admission to PhD programs in business. Advanced, doctoral-level topics in marketing management.

592 Seminar in Marketing Theory 3 Course Prerequisite: Admission to PhD programs in business. Advanced, doctoral-level topics in marketing theory.

593 Seminar in Research Design 3 Course Prerequisite: Admission to PhD programs in business. Advanced, doctoral-level topics in research design.

600 Special Projects or Independent Study V 1-18 May be repeated for credit. Course Prerequisite: Admission to the MBA, Master of Accounting, or Business PhD programs. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.

702 Master's Special Problems, Directed Study, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admission to the MBA program. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Business Administration - Marketing PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Gene and Linda Voiland School of Chemical Engineering and Bioengineering

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Director and Professor, J. N. Petersen; Associate Director and Associate Professor, N. Abu-Lail; B. Wise Professor of Energy Production, M. Levin; Bill Thomson Professor of Practice, C. Sonnichsen; Paul Hohenschuh Distinguished Professor, H. Beyenal; Voiland Distinguished Professors, N. Kruse, Y. Wang; Professors, B. Ahring, C. F. Ivory, B. J. Van Wie; Associate Professors, W. Dong, S. Ha, D. Lin, H. Lin, J. Resat, A. Vasavada; Assistant Professors, A. Kostyukova, J.S. McEwen, S. Saunders, D. Wu, X. Zhang. Clinical Assistant Professor, H. Davis; Professors Emeriti, D. C. Davis, K. C. Liddell, R. Mahalingam, R. C. Miller, W. J. Thomson, R. Zollars.

The mission of the Gene and Linda Voiland School of Chemical Engineering and Bioengineering is to deliver academic programs in Chemical Engineering and Bioengineering that advance the boundaries of knowledge, educate competent engineering professionals, and contribute to the needs of society. Faculty, staff, and students engage in discovery, teaching, application, and integration, along with periodic review of achievement, to develop practitioners and scholars prepared to make meaningful and responsible contributions to society.

The Program Educational Objectives for baccalaureate degree programs in Chemical Engineering and Bioengineering define achievements of which these graduates are capable. As appropriate for their chosen career paths, within five to ten years of graduation, program graduates will be able to:

- Engage successfully in graduate or professional education or entry-level employment.
- Perform responsibly and professionally in their chosen career paths.
- Exhibit continued growth of effective communication and collaboration skills.
- Demonstrate ongoing development of competent and innovative problem solving skills.
- Continue learning and accept increasing levels of responsibility over time.

These long-term educational objectives will be achieved through development of our Student Outcomes in a culture of integration and engagement. Student Outcomes lay a solid, well-rounded foundation from which to build longer-term capabilities. Systemic integration of theory and practice deepens students' understanding and builds confidence they will need for bold innovation and lifelong learning. Frequent engagement of students with peers, faculty, and external constituencies builds their interpersonal skills, refines their understanding, and leads them to opportunities for advanced study or employment. Dedicated faculty who effectively teach, mentor, refer, and model professional behaviors prepare our graduates for the professional world.

The school offers courses of study leading to the degrees of Bachelor of Science in Bioengineering,

Bachelor of Science in Chemical Engineering, Master of Science in Chemical Engineering, and Doctor of Philosophy, with a focus in chemical engineering. We also graduate students who receive the Master of Science in Engineering and the Doctor of Philosophy in Engineering Science with an emphasis in bioengineering.

Chemical Engineering

The curriculum in chemical engineering provides thorough knowledge of basic science and engineering. This includes material and energy balances, chemical and physical equilibria, rate processes, and economic balances. With such training, graduates may participate in the design and operation of chemically based products or they may engage in research leading to new or improved chemical processes, products, and uses. Graduates also find rewarding work in plant operation, plant management, university teaching, sales-service, and other functions requiring chemical engineering training. Many students also use their educations in chemical engineering as preparation for other professional degrees such as medicine or law. The curriculum in chemical engineering is accredited by ABET.

Student Learning Outcomes

To guide our student activities in developing the skills to meet the School's objectives we will monitor their attainment of the Student Outcomes as set forth by ABET. These are: a) an ability to apply knowledge of mathematics, science, and engineering, b) an ability to design and conduct experiments, as well as to analyze and interpret data, c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability, d) an ability to function on multi-disciplinary teams, e) an ability to identify, formulate, and solve engineering problems, f) an understanding of professional and ethical responsibility, g) an ability to communicate effectively, h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context, i) a recognition of the need for, and an ability to engage in, life-long learning, j) a knowledge of contemporary issues, k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

In addition to these Outcomes we will also monitor the program criteria for chemical, biochemical, biomolecular or similarly named engineering programs, as set forth by the American Institute of Chemical Engineers (AIChE). These criteria are, respectively: "The curriculum must provide (1) a thorough grounding in the basic sciences including chemistry, physics, and biology, with some content at an advanced level, as appropriate to the objectives of the program. The curriculum must include (2) the engineering application of these basic sciences to the design, analysis, and control of chemical, physical, and/or biological processes, including the hazards associated with these processes." (Numerals added to original AIChE statement).

Online at: <http://www.chebe.wsu.edu/academics/che/cheprogram.html>

Chemical Engineering Certification

Specific requirements for certification in chemical engineering can be obtained from the school although eligibility usually occurs at the middle of the sophomore year. Criteria for certification include overall GPA, grades earned in mathematics, chemistry, and physical science courses, and performance in the CHE 201 course. The total number of Chemical Engineering majors is restricted at the junior level. A certified student who is deficient under the University's Educational Policies and Procedures is subject to decertification. Students are allowed a maximum total of one repeat among all core chemical engineering courses.

Bioengineering

Bioengineering is an engineering discipline that integrates engineering and life sciences to address issues important to human and animal well-being and to society at large. As such, the educational objective of the BS Bioengineering degree is to prepare graduates for productive employment, advanced study, or professional programs where they apply principles and methods of both engineering and life sciences to solve problems affecting human and animal health and well-being. Graduates may apply their expertise in human and animal medicine, biotechnology, or related biology-based engineering fields.

With these integrated science and engineering skills, bioengineering graduates are able to make valuable contributions to human and animal health care and environments, bio-based product development, and biotechnology. At Washington State University, bioengineering cooperates with and finds applications in numerous disciplines of engineering, veterinary medicine, and medical sciences. The bioengineering curriculum easily accommodates pre-medical, pre-dental, and pre-veterinary requirements for those students wishing to apply to professional schools in health care fields.

The total number of majors in bioengineering is restricted at the junior level.

Student Learning Outcomes

Bioengineering graduates are able to demonstrate the following Student Outcomes:

- **APPLICATION OF MATH/SCIENCE/ENGINEERING:** Students demonstrate an ability to use foundational knowledge in mathematics, physics, chemistry, biology, physiology, and engineering sciences.
- **EXPERIMENTATION:** Students demonstrate ability to design and conduct experiments, make measurements, analyze data, and interpret results and interactions between living systems and nonliving materials and systems.
- **BIOENGINEERING DESIGN:** Students demonstrate ability to design engineering solutions to meet needs with biological considerations and constraints of producers, users, investors and society.
- **TEAMWORK:** Students demonstrate an ability to work in teams comprised of engineers and others to produce joint work products.
- **SYSTEMS SOLUTIONS:** Students demonstrate ability to use analogous thinking, synthesis and analysis, integrative systems approaches, and associated tools to solve engineering problems.

- **PROFESSIONAL ETHICS:** Students demonstrate understanding of professional and ethical responsibility and reasoning suitable for professional decision-making.
 - **COMMUNICATION:** Students demonstrate ability to communicate effectively in written and oral forms to interdisciplinary audiences.
 - **CRITICAL THINKING:** Students demonstrate ability to analyze and evaluate scientific and engineering arguments or claims and to critically relate such claims to global, economic, environmental, professional, and societal issues.
 - **INDEPENDENT LEARNING:** Students demonstrate awareness of a need for ongoing professional growth and ability to learn independently to address challenges they encounter.
 - **CONTEMPORARY ISSUES:** Students demonstrate awareness of diverse contemporary issues that influence their career development and professional practice.
 - **PHYSIOLOGY AND BIOLOGY:** Students demonstrate advanced knowledge of physiology and biology and can identify and solve problems which require the integration of that knowledge with engineering and advanced mathematical tools.
- Online at <http://www.chebe.wsu.edu/academics/be/beprogram.html>.

Bioengineering Certification

Specific requirements for certification in bioengineering can be obtained from the school although eligibility usually occurs at the end of the sophomore year. Criteria for certification include overall GPA, grades earned in biology, chemistry, mathematics and physical science courses, and performance in the CHE 201 course. A certified student who is deficient under the University's Educational Policies and Procedures is subject to decertification. Students are allowed a maximum total of one repeat among all core bioengineering courses.

Computer Requirement

All Chemical Engineering and Bioengineering students are required to purchase laptop computers. Please contact the school for details and specifications or visit <http://voiland.wsu.edu/academics.html>.

Transfer Students

Students who are planning to transfer to Chemical Engineering or Bioengineering at Washington State University from other institutions should coordinate their programs with the school to establish a schedule of studies leading to the bachelor's degree. This is desirable because of sophomore professional requirements and course sequences. A strong preparation in chemistry, mathematics (through differential equations), and physics is necessary prior to transfer to minimize the time required at Washington State University to complete bachelor's degree requirements. Inquiries concerning specific questions are welcomed. The curricula in Bioengineering and in Chemical Engineering are accredited by ABET.

Preparation for Graduate Study

As preparation for work toward an advanced degree in Chemical Engineering, a student should have completed the equivalent of the following

chemical engineering schedule of studies. A Bachelor of Science degree in Chemical Engineering from an institution accredited by ABET normally will satisfy this requirement.

Students seeking advanced training in bioengineering should use the Engineering Science degree program. Such students should have completed the equivalent of the bioengineering program outlined above. A Bachelor of Science degree from any ABET accredited engineering program would normally satisfy this requirement.

Special programs are also available for students with bachelor's degrees in chemistry, biology, or other areas of science who wish to obtain advanced degrees.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

BIOENGINEERING, GENERAL OPTION (120 HOURS)

Students who plan to pursue pre-med studies should consult their advisor for further information about appropriate courses.

Criteria for Certification – Bioengineering Program

- 1) In March of each year, the faculty of the School of Chemical Engineering and Bioengineering will establish the total number of students (June and January) to be certified into the Bioengineering program.
- 2) Each student will be considered for certification during the semester after she/he has completed all of the following courses: MATH 171, MATH 172, CHEM 105, CHEM 106, BIOLOGY 107, PHYSICS 201, CHE 201.
- 3) To be certified, each student must meet the following minimum standards:
 - a. 2.0 cumulative GPA.
 - b. A "C" grade or better in each of the courses listed in 2) above.
 - c. Complete at least one term of coursework at WSU as a full-time student.
 - d. Students must be in good academic standing (semester GPA 2.00 or higher) at the time they are being considered for certification.
- 4) Certification decisions will be made at the end of Fall and Spring semesters, and those being certified at the end of Spring semester will be notified by June 1, while those being certified at the end of Fall semester will be notified by January 15.
- 5) If the number of students seeking certification exceeds the program capacity, as determined in 1) above, additional criteria will be used to select those who are certified. Those criteria include: (a) average GPA received in the courses listed in 2) above; (b) average GPA earned in all the engineering/math/science courses which have already been completed; and (c) the GPA earned during the previous semester.
- 6) Students who have completed all the courses listed in 2) above, but who are not certified will be notified of the decision according to the time table described in 4) above. Such students who are not certified may appeal the decision. This appeal should describe any special circumstances which

should be considered. A faculty committee will consider the appeal, the special circumstances described, and trends in the grades (e.g. trends in grades and/or withdrawals, typical course load attempted and typical course load completed) and make a final decision regarding certification. The appeal must be submitted within 2 weeks of the notification described in 4) above. The appeal will be considered and a decision made by July 1 and February 15.

7) Students who are deficient under the University's Educational Policies and Procedures are subject to decertification. Recertification will be granted only under rare, extenuating conditions.

First Year

<i>First Term</i>	<i>Hours</i>
CHEM 105 [PSCI]	4
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3
ENGR 120	2
MATH 171 [QUAN]	4
<i>Second Term</i>	<i>Hours</i>
BIO ENG 140	1
BIOLOGY 107 [BSCI]	4
CHEM 106	4
HISTORY 105 [ROOT]	3
MATH 172	4

Second Year

<i>First Term</i>	<i>Hours</i>
BIO ENG 205	1
CHE 201	3
Humanities [HUM]	3
MATH 220	2
MATH 273	2
PHYSICS 201	4
<i>Second Term</i>	<i>Hours</i>
BIO ENG 210	2
CE 211	3
MATH 315	3
PHYSICS 202	4
STAT 370 or 423	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
BIO ENG 321	3
BIO ENG 322 [M]	1
BIO ENG 350	3
CHE 310	3
E E 261	3
<i>Second Term</i>	<i>Hours</i>
BIO ENG 330	3
BIO ENG 340	4
Bioengineering elective ¹	3
Diversity [DIVR]	3
ECONS 101 [SSCI] or 102 [SSCI]	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
BIO ENG 410 [M]	3
BIO ENG 440	4
Communication [COMM] or Written Communication [WRTG]	3
Technical electives ²	6

<i>Second Term</i>	<i>Hours</i>
BIO ENG 411 [CAPS]	3
Bioengineering electives ¹	3
Technical electives ²	6
Elective	1
Complete BIO ENG Exit Interview	

¹ 6 credits of electives must have a BIO ENG subject, selected from the following: BIO ENG 425 or BIO ENG 481.

² 12 credits of electives may be either BIO ENG courses (not used to fulfill Bioengineering elective requirements) from Footnote 1, or other relevant engineering or science courses from the following: BIO ENG 495, 499; BIOLOGY 106, 301, 315, 340, 352, 353, 494; CE 315, 463; CHE 301, 334, 475, 476; CHEM 345, 348; CPT S 121; E E 262; MBIOS 301, 303, 305, 306, 401/501, 413, 414, 426, 465; ME 116, 212, 216, 301, 303, 401, 472, 473; MSE 201, 302, 401, 402, 403, 406/506, 413; NEUROSCI 301, 302, 403 [M], 425, 426, 430 [M]; PHYSICS 466.

BIOENGINEERING, PRE-MED OPTION (127 HOURS)

Students who plan to pursue pre-med studies should consult their advisor for further information about appropriate courses.

Criteria for Certification – Bioengineering Program

1) In March of each year, the faculty of the School of Chemical Engineering and Bioengineering will establish the total number of students (June and January) to be certified into the Bioengineering program.

2) Each student will be considered for certification during the semester after she/he has completed all of the following courses: MATH 171, MATH 172, CHEM 105, CHEM 106, BIOLOGY 107, PHYSICS 201, CHE 201.

3) To be certified, each student must meet the following minimum standards:

- a. 2.0 cumulative GPA.
- b. A "C" grade or better in each of the courses listed in 2) above.

c. Complete at least one term of coursework at WSU as a full-time student.

d. Students must be in good academic standing (semester GPA 2.00 or higher) at the time they are being considered for certification.

4) Certification decisions will be made at the end of Fall and Spring semesters, and those being certified at the end of Spring semester will be notified by June 1, while those being certified at the end of Fall semester will be notified by January 15.

5) If the number of students seeking certification exceeds the program capacity, as determined in 1) above, additional criteria will be used to select those who are certified. Those criteria include: (a) average GPA received in the courses listed in 2) above; (b) average GPA earned in all the engineering/math/science courses which have already been completed; and (c) the GPA earned during the previous semester.

6) Students who have completed all the courses listed in 2) above, but who are not certified will be notified of the decision according to the time table described in 4) above. Such students who are not certified may appeal the decision. This appeal

should describe any special circumstances which should be considered. A faculty committee will consider the appeal, the special circumstances described, and trends in the grades (e.g. trends in grades and/or withdrawals, typical course load attempted and typical course load completed) and make a final decision regarding certification. The appeal must be submitted within 2 weeks of the notification described in 4) above. The appeal will be considered and a decision made by July 1 and February 15.

7) Students who are deficient under the University's Educational Policies and Procedures are subject to decertification. Recertification will be granted only under rare, extenuating conditions.

First Year

<i>First Term</i>	<i>Hours</i>
CHEM 105 [PSCI]	4
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3
ENGR 120	2
MATH 171 [QUAN]	4

<i>Second Term</i>	<i>Hours</i>
BIO ENG 140	1
BIOLOGY 107 [BSCI]	4
CHEM 106	4
HISTORY 105 [ROOT]	3
MATH 172	4

Second Year

<i>First Term</i>	<i>Hours</i>
BIO ENG 205	1
BIOLOGY 106	4
CHE 201	3
MATH 220	2
MATH 273	2
PHYSICS 201	4

<i>Second Term</i>	<i>Hours</i>
BIO ENG 210	2
CE 211	3
MATH 315	3
PHYSICS 202	4
STAT 370 or 423	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
BIO ENG 321	3
BIO ENG 322 [M]	1
CHE 310	3
CHEM 345	4
E E 261	3
MBIOS 301	4

<i>Second Term</i>	<i>Hours</i>
BIO ENG 330	3
BIO ENG 340	4
CHEM 348	4
Humanities [HUM]	3
MBIOS 303	4

Fourth Year

<i>First Term</i>	<i>Hours</i>
BIO ENG 350	3
BIO ENG 410 [M]	3
BIO ENG 440	4

Communication [COMM] or Written Communication [WRTG]	3
Diversity [DIVR]	3

<i>Second Term</i>	<i>Hours</i>
BIO ENG 411 [CAPS]	3
Bioengineering Electives ¹	6
ECONS 101 [SSCI] or 102 [SSCI]	3
Complete BIO ENG Exit Interview	

¹ 6 credits of electives must have a BIO ENG subject, selected from the following: BIO ENG 425 or BIO ENG 481.

CHEMICAL ENGINEERING - GENERAL (127 HOURS)

At least 66 of the total hours required for this degree must be in 300-400-level courses.

Criteria for Certification - Chemical Engineering Program

1) In September of each year, the faculty of the School of Chemical Engineering and Bioengineering will establish the total number of students (June and January) to be certified into the chemical engineering program.

2) Each student will be considered for certification during the semester after she/he has completed all of the following courses: MATH 171, MATH 172, MATH 273; CHEM 105, CHEM 106, CHEM 345, PHYSICS 201, CHE 201.

3) To be certified, each student must meet the following minimum standards:

- 2.0 cumulative GPA.
- A "C" grade or better in each of the courses listed in 2) above.
- Be in good academic standing (semester GPA 2.00 or higher) at the time they are being considered for certification.

4) Certification decisions will be made at the end of Fall and Spring semesters, and those being certified at the end of Spring semester will be notified by June 1, while those being certified at the end of Fall semester will be notified by January 15.

5) If the number of students seeking certification exceeds the program capacity, as determined in 1) above, additional criteria will be used to select those who are certified. Those criteria include: (a) average GPA received in the courses listed in 2) above; (b) average GPA earned in all the engineering/math/science courses which have already been completed; and (c) the GPA earned during the previous semester.

6) Students who have completed all the courses listed in 2) above, but who are not certified will be notified of the decision according to the time table described in 4) above. Such students who are not certified may appeal the decision. This appeal should describe any special circumstances which should be considered. A faculty committee will consider the appeal, the special circumstances described, and trends in the grades (e.g. trends in grades and/or withdrawals, typical course load attempted and typical course load completed) and make a final decision regarding certification. The appeal must be submitted within 2 weeks of the notification described in 4) above. The appeal will be considered and a decision made by July 1 and February 15.

7) Students who are deficient under the University's Educational Policies and Procedures are subject to decertification. Recertification will be granted only under rare, extenuating conditions.

First Year

<i>First Term</i>	<i>Hours</i>
CHEM 105 [PSCI]	4
Diversity [DIVR]	3
ECONS 101 [SSCI] or 102 [SSCI]	3
HISTORY 105 [ROOT]	3
MATH 171 [QUAN]	4

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI], 107 [BSCI], or 110 [BSCI]	3 or 4
CHE 110	2
CHEM 106	4
ENGLISH 101 [WRTG]	3
MATH 172	4

Second Year

<i>First Term</i>	<i>Hours</i>
CHE 201	3
CHEM 345	4
Humanities [HUM]	3
MATH 273	2
PHYSICS 201	4

<i>Second Term</i>	<i>Hours</i>
CHE 211	3
CHEM 348 or MBIOS 303	4
MATH 220	2
MATH 315	3
PHYSICS 202	4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
CHE 301	3
CHE 310	3
CHEM 331	3
CHEM 333 or 334 [M]	1 or 2
Creative & Professional Arts [ARTS]	3
Technical Elective ¹	3

<i>Second Term</i>	<i>Hours</i>
CHE 321	3
CHE 332	3
CHE 334	3
CHE 352	3
CHE 398	1
STAT 423	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
CHE 432 [M]	3
CHE 441	3
CHE 450	3
ENGLISH 402 [WRTG] [M]	3
CHE Elective ²	3

<i>Second Term</i>	<i>Hours</i>
CHE 433 [M]	2
CHE 451 [M] [CAPS]	3
CHE 498	1
CHE Elective ²	6
Technical Elective ¹	3
Exit Interview	

¹ Technical Elective: Any 300-400-level BIO ENG, CHEM, CHE, CE, E E, ENGR, MATH, ME, MSE, or PHYSICS course as approved by advisor.

² CHE 461, 465, 475, 476, 481, 495, and 499. Of the total of 9 credits in chemical engineering electives, a cumulative total of only 3 credits is allowed in CHE 495 and 499 combined.

Description of Courses

BIOENGINEERING

BIO ENG

140 Introduction to Bioengineering 1 Seminar on current topics and issues in bioengineering; career options in bioengineering. S, F grading.

205 Bioengineering Professional Preparation and Ethics 1 Professional preparation for careers in bioengineering; ethical, social, and professional issues in bioengineering. S, F grading.

210 Bioengineering Analysis 2 (1-3) Course Prerequisite: CHE 201 with a C or better; MATH 220 or concurrent enrollment. Analytical problem solving, modeling and computer methods for bioengineering applications.

321 Mechanics of Biological Materials 3 Course Prerequisite: CE 211 with a C or better; certified major in Bioengineering. Mechanical behavior of biological and engineering materials; relationships between external loads and internal stresses and strains within a structure.

322 [M] Mechanics of Biological Materials Lab 1 (0-3) Course Prerequisite: BIO ENG 321 or concurrent enrollment; and STAT 370 or concurrent enrollment or STAT 423 or concurrent enrollment; certified major in Bioengineering. Laboratory experiments focused on mechanics of biological and engineering materials; experimental design and statistical analysis of data; scientific writing.

330 Bioinstrumentation 3 (2-3) Course Prerequisite: E E 261 with a C or better; certified major in Bioengineering. Principles of instrumentation applicable to bioengineering systems; experimental design for measurement systems.

340 Unified Systems Bioengineering I 4 (3-3) Course Prerequisite: BIO ENG 210 or concurrent enrollment; E E 261 with a C or better; certified major in Bioengineering. Foundation for dynamic modeling and design of physiological systems; part one of two-semester course.

350 Introduction to Cellular Bioengineering 3 Course Prerequisite: MATH 315 with a C or better; certified major in Bioengineering. Integrating cellular biology and engineering science by applying quantitative engineering principles for development of cellular-based materials, diagnostic devices and sensor designs.

- 410 [M] Bioengineering Capstone Project I 3** (2-3) Course Prerequisite: BIO ENG 321 with a C or better; BIO ENG 322 with a C or better; BIO ENG 330 with a C or better; BIO ENG 340 with a C or better. Part I of capstone engineering design project; customer needs, design requirements, conceptual design, business assessment, project proposal, and presentation.
- 411 [CAPS] Bioengineering Capstone Project II 3** (2-2) Course Prerequisite: BIO ENG 410 with a C or better; senior standing. Detailed design and business case for a biological engineering-related process, machine, structure, or system. Recommended preparation: ECONS 101 or 102.
- 425 Biomechanics 3** Course Prerequisite: BIO ENG 321 with a C or better or CE 215 with a C or better; MATH 315 with a C or better. Methods for analysis of rigid body and deformable mechanics; application to biological tissue, especially bone, cartilage, ligaments, tendon and muscle. (Crosslisted course offered as BIO ENG 425/525, ME 525). Credit not granted for more than one of BIO ENG 425, BIO ENG 525, or ME 525.
- 440 Unified Systems Bioengineering II 4** (3-3) Course Prerequisite: BIO ENG 210 with a C or better; BIO ENG 340 with a C or better. Continuation of BIO ENG 340; emphasis on feedback control system analysis and design, with examples from physiological systems.
- 455 Metabolic Engineering 3** Course Prerequisite: BIO ENG 210 or CHE 211; CHE 201; MATH 220; MATH 315. Understanding metabolic properties of organisms such that cells can be modified for use as biochemical plants to produce desired bioproducts. (Crosslisted course offered as BIO ENG 455, CHE 474).
- 481 Advanced Topics in Bioengineering V** 1-3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Junior standing; instructor permission. Advanced topics in bioengineering.
- 488 Professional Practice Coop/Internship I V** 1-2 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: By department permission. Practicum for students admitted to the VCEA Professional Practice and Experiential Learning Program; integration of coursework with on-the-job professional experience. (Crosslisted course offered as ENGR 488, BIO ENG 488, CHE 488, CE 488, CPT S 488, E E 488, ME 488, MSE 488, SDC 488). S, F grading.
- 495 Internship in Bioengineering V** 1-3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: BIO ENG 205; junior standing; instructor permission. Work experience related to academic learning. S, F grading.
- 499 Special Problems in Bioengineering V** 1-4 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Sophomore standing; instructor permission. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 525 Biomechanics 3** Methods for analysis of rigid body and deformable mechanics; application to biological tissue, especially bone, cartilage, ligaments, tendon and muscle. (Crosslisted course offered as BIO ENG 425/525, ME 525). Credit not granted for more than one of BIO ENG 425, BIO ENG 525, or ME 525.
- 541 Systems Bioengineering 3** Physiological systems emphasizing the cardiovascular, pulmonary, renal, endocrine, musculoskeletal, nervous and sensory systems.
- 550 Cellular Bioengineering 3** Cellular biology integrated with engineering science; cellular phenomena from an engineering perspective; quantitative engineering principles for cellular-based materials, diagnostic device and sensor designs.

CHEMICAL ENGINEERING

Only certified chemical engineering majors may enroll in upper-division (300-400-level) CHE courses. Exemptions must be made with permission of the director of the school.

CHE

110 Introduction to Chemical Engineering 2 Course Prerequisite: CHEM 105 with a C or better or concurrent enrollment; MATH 171 with a C or better or concurrent enrollment. Introduction to chemical engineering, development of problem solving skills.

201 Chemical Process Principles and Calculations 3 Course Prerequisite: CHEM 106 with a C or better or concurrent enrollment, or CHEM 331, CHEM 345, or CHEM 348; MATH 172 or 182 with a C or better or concurrent enrollment, or MATH 273 or MATH 315. Fundamental concepts of chemical engineering; problem-solving techniques and applications in stoichiometry, material and energy balances, and phase equilibria.

211 Process Simulation 3 Course Prerequisite: MATH 315 with a C or better or concurrent enrollment. Computer solutions to problems in chemical engineering processing.

301 Chemical Engineering Thermodynamics 3 Course Prerequisite: CHE 201 with a C or better; CHEM 331 with a C or better or concurrent enrollment; certified Chemical Engineering major. Basic concepts and laws; property relationships; compression and liquefaction; phase equilibria; reaction equilibria; applications in stagewise processing.

310 Introduction to Transport Processes 3 Course Prerequisite: CHE 201 with a C or better; MATH 315 with a C or better or concurrent enrollment; certified major in Chemical Engineering or Bioengineering. Fundamentals of the phenomena governing the transport of momentum, energy, and mass.

321 Kinetics and Reactor Design 3 Course Prerequisite: CHE 301 with a C or better; CHEM 331 with a C or better; MATH 315 with a C or better; certified Chemical Engineering major. Chemical reaction kinetics applied to the design of reactors, non-ideal flow, mixing, catalysis.

332 Fluid Mechanics and Heat Transfer 3 Course Prerequisite: CHE 310 with a C or better; certified Chemical Engineering major. Design calculations, operations, and evaluation of equipment used in fluid flow, heat transfer, and evaporation.

334 Chemical Engineering Separations 3 Course Prerequisite: CHE 301 with a C or better; CHE 310 with a C or better; CHE 332 with a C or better or concurrent enrollment; certified Chemical Engineering major. Design and evaluation of equipment used in continuous contacting.

352 Chemical Process Safety 3 Course Prerequisite: CHE 201 with a C or better; certified major in Chemical Engineering. Introduction to technical fundamentals of chemical process safety.

398 Technical Seminar 1 May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: Certified Chemical Engineering major; junior standing. May be repeated for credit; cumulative maximum 2 hours. S, F grading.

432 [M] Chemical Engineering Lab I 3 (1-6) Course Prerequisite: CHE 321 with a C or better; CHE 332 with a C or better; CHE 334 with a C or better; CHE 352 with a C or better. Statistical design and analysis of experiments; safety; experiments in heat and mass transfer; separations, other unit operations, kinetics, control; technical reports and presentations.

433 [M] Chemical Engineering Lab II 2 (0-6) May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: CHE 432 with a C or better. Laboratory experiments in heat and mass transfer; separations, other unit operations, kinetics, control; design calculations; technical reports and presentations.

441 Process Control 3 Course Prerequisite: CHE 211 with a C or better, or CHE 310 with a C or better. Measuring instruments, automatic control, process and instrument characteristics and theory applied to industrial control problems.

450 Chemical Process Analysis and Design I 3 Course Prerequisite: CHE 321 with a C or better; CHE 332 with a C or better; CHE 334 with a C or better; CHE 352 with a C or better. Chemical engineering design; computer tools; safety and environmental constraints; cost and equipment optimization.

- 451 [CAPS] [M] Chemical Process Analysis and Design II** 3 Course Prerequisite: CHE 450 with a C or better. Development, design, and economic evaluation of chemical and related processes as practiced in industry.
- 461 Introduction to Nuclear Engineering** 3 Course Prerequisite: MATH 315; certified major in engineering or physical sciences; senior standing. Applied nuclear physics; application to the nuclear fuel cycle and nuclear reactor core design; nuclear reactor systems and safety. (Crosslisted course offered as ME 461, CHE 461).
- 462 Applied Electrochemistry** 3 Course Prerequisite: CHE 301 with a C or better; CHE 310 with a C or better; CHE 321 with a C or better; CHEM 331 with a C or better; certified major in Chemical Engineering. Thermodynamics, kinetics, and transport processes that occur in a simple model electrochemical system and how to apply them into more complicated real systems.
- 465 Integrated Envirochemical Engineering** 3 Course Prerequisite: CHE 321 with a C or better; CHE 334 with a C or better. Application of chemical engineering principles in assessment and remediation of industrial problems in air pollution, water pollution, and solid and hazardous waste.
- 474 Metabolic Engineering** 3 Course Prerequisite: BIO ENG 210 or CHE 211; CHE 201; MATH 220; MATH 315. Understanding metabolic properties of organisms such that cells can be modified for use as biochemical plants to produce desired bioproducts. (Crosslisted course offered as BIO ENG 455, CHE 474).
- 475 Introduction to Biochemical Engineering** 3 Course Prerequisite: CHE 321 with a C or better; CHE 332 with a C or better. Application of chemical engineering principles to the processing of biological and biochemical materials.
- 476 Biomedical Engineering Principles** 3 Course Prerequisite: CHE 310 with a C or better. The application of chemical engineering principles to biomedical processes.
- 481 Special Topics in Chemical Engineering** V 1-3 May be repeated for credit; cumulative maximum 9 hours. Interfacial phenomena, high temperature material processing, catalysis, biofilms, environmental technology, oil production, integrated circuit manufacturing, in situ destruction of hazardous waste.
- 485 Interfacial Phenomena** 3 Chemical and physical nature of the interface including the molecular basis for interfacial forces and resulting macroscopic phenomena. Credit not granted for both CHE 485 and 585.
- 488 Professional Practice Coop/Internship I** V 1-2 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: By department permission. Practicum for students admitted to the VCEA Professional Practice and Experiential Learning Program; integration of coursework with on-the-job professional experience. (Crosslisted course offered as ENGR 488, BIO ENG 488, CHE 488, CE 488, CPT S 488, E E 488, ME 488, MSE 488, SDC 488). S, F grading.
- 495 Chemical Engineering Internship 2** May be repeated for credit; cumulative maximum 4 hours. Students work full time in engineering assignments in approved industries with prior approval of advisor and industrial supervisor. S, F grading.
- 498 Technical Seminar** 1 May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: Certified major in Chemical Engineering; senior standing. S, F grading.
- 499 Special Problems V** 1-4 May be repeated for credit. Course Prerequisite: Sophomore standing; instructor permission. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 510 Transport Processes** 3 Transport of mass, energy, and momentum; unsteady and steady states as applied to chemical processing; macroscopic and microscopic analyses. Cooperative: Open to UI degree-seeking students.
- 527 Chemical Thermodynamics** 3 Thermodynamic laws for design and optimization of thermodynamic systems, equations of state, properties of ideal and real fluids and fluid mixtures, stability, phase equilibrium, chemical equilibrium; applications of the thermodynamic principles. Cooperative: Open to UI degree-seeking students.
- 529 Chemical Engineering Kinetics** 3 Interpretation of kinetic data and design of nonideal chemical reactors; fundamentals of heterogeneous catalysis, catalyst preparation, characterization, and theory. Cooperative: Open to UI degree-seeking students.
- 541 Chemical Engineering Analysis** 3 Mathematical analysis of chemical engineering operations and processes; mathematical modeling and computer application. Cooperative: Open to UI degree-seeking students.
- 549 Biochemical Conversion Laboratory** 2 (1-3) Analytical techniques in biomass characterization; bioproduct/biofuel production from renewable biomass including biochemical processes.
- 560 Biochemical Engineering** 3 Chemical engineering applied to biological systems; fermentation processes, biochemical reactor design, downstream processing, transport phenomena in biological systems, biochemical technology. Cooperative: Open to UI degree-seeking students.
- 574 Protein Biotechnology** 3 Biotechnology related to the isolation, modification and large scale commercial production, patenting and marketing of useful recombinant proteins and products. (Crosslisted course offered as MBIOS 574, CHE 574). Recommended preparation: MBIOS 513.
- 581 Advanced Topics in Chemical Engineering V** 1-3 May be repeated for credit; cumulative maximum 9 hours. Filtration, reaction engineering, two-phase flow, non-Newtonian fluids, interfacial phenomena, fluidization, novel separations, biomedical engineering.
- 585 Interfacial Phenomena** 3 Chemical and physical nature of the interface including the molecular basis for interfacial forces and resulting macroscopic phenomena. Credit not granted for both CHE 485 and 585.
- 596 Research Methods and Presentation I** 2 Establish sound practices for graduate research and presentation of results; techniques used for performing through literature searching and establishing and testing research hypotheses.
- 597 Research Methods and Presentation II** 2 Establishing sound practices for presentation of research programs and research results.
- 598 Research Seminar** 1 May be repeated for credit. Seminar presentations on current topics in chemical engineering research. S, F grading.
- 700 Master's Research, Thesis, and/or Examination V** 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 702 Master's Special Problems, Directed Study, and/or Examination V** 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.
- 800 Doctoral Research, Dissertation, and/or Examination V** 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Chemical Engineering or Engineering Science PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Department of Chemistry

chemistry.wsu.edu

Fulmer 305

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Professor and Department Chair, K. Peterson; Regents Professors, S. Clark, H. Hill; Professors, C. Berkman, P. Garner, K. Hipps, J. Jones, C. Kang, A. Li, U. Mazur, J. McHale, K. Nash, R. Ronald, M. Xian, C.-S. Yoo, S. Wherland; Associate Professors, P. Benny, J. Brozik,

A. Clark, P. Reilly, N. Wall; Assistant Professors, B. Clowers, U. Fittschen, Z. Heiden, D. Lee, M. Rock, Q. Zhang; Clinical Associate Professors, P. Buckley, G. Crouch, J. Lessmann, L. Scudiero; Adjunct Faculty, S. Bryan, D. Davydov, D. Feller, A. Felmy, S. Guharay, S. Metcalf, J. Saludes, A. Harwood, E. Valente; Instructor, M. Finnegan, A. Nielsen, K. Nishida, C. Zhu; WSUTC Coordinator, A. Felsot.

Chemistry is the fundamental science of matter, the nature of substances, and the changes occurring in them. Chemical reactions are the basis of all life on earth. Everything we are or do depends in one way or another on chemistry. A major in chemistry prepares you for a variety of careers in industry, education, and public service, or for graduate study and research in chemistry and many related fields.

The department has excellent facilities and special equipment for study and research at both the undergraduate and graduate level. There are active research programs in both traditional and emerging areas of chemistry. Students in chemistry at WSU are encouraged to take advantage of its excellent facilities and faculty by beginning research projects as early as possible. Research expands experience beyond the classroom into the realm of new knowledge.

We expect that our graduating students will: 1) demonstrate their knowledge of the principals of the major subfields of chemistry, organic, analytical, physical, inorganic, and biochemistry, and be able to use it in the solution of the daily needs and future problems of the workplace and society; 2) demonstrate independence and creativity through individual work in the research laboratory; 3) be able to access, read, and critically evaluate the chemical and general scientific literature; 4) apply their skills and knowledge of chemistry within the context of a strong, fundamental general education; and 5) communicate effectively both orally and in writing.

Typical areas for research include:

- Analytical chemistry research spans fundamental developments in instrumentation, synthetic methodologies, molecular recognition and other strategies used in separations science. These methodologies are frequently used by our faculty to understand the migration of species through biological and environmental systems.
- One of the nation's strongest university-based radiochemistry research program is centered in the Department. Research areas include investigation of radionuclides in the environment, development of radiopharmaceuticals, nuclear forensics, separation of lanthanides and actinides, and computation chemistry related to the lanthanides and actinides. The faculty work extensively with the Nuclear Radiation Center and take advantage of its 1 MW nuclear reactor.
- Inorganic chemistry has as its center the study of the vast majority of the known elements and especially the transition metals; it includes development of catalysts for organic and inorganic transformations and investigation of the properties of organometallic compounds, investigation of the bioinorganic of metal containing proteins and radiopharmaceuticals, as well as inorganic radiochemical research on separation methods for lanthanides and actinides.
- Materials chemistry brings the knowledge and understanding of chemistry to the study of the structure and properties of materials. It involves

the study of chemical reactions and physical processes occurring at surfaces and in solids by both experimental and theoretical means. It includes important phenomena such as energy transfer in light absorbing and emitting materials, electrical and heat transport in solids, and extends to the synthesis of new and improved materials, including nanomaterials.

- Organic chemistry deals with the many compounds of carbon and how these compounds interact in biological systems. It includes the study of medicinal, bioorganic, mechanistic, and synthetic chemistry and how these areas may be used in areas such elucidation of metabolic pathways, drug development in the treatment of diseases, and environmentally benign synthesis of important chemicals.
- Physical chemistry applies the methods and theories of physics to the study of chemical, biological, and nanoscale materials. It involves theoretical studies of chemical bonding using advanced computational methods and the investigation of the structures of solids and surfaces by a variety of instrumental methods including photon spectroscopies, X-ray techniques, and surface characterization. It also expands our understanding of molecular scale mechanisms for kinetically and thermodynamically driven processes.

The Department of Chemistry is on the approved list of the American Chemical Society and offers courses of study leading to the degrees of Bachelor of Science in Chemistry, with options in general chemistry, materials chemistry, and environmental chemistry. In addition, graduate study programs leading to the Master of Science in Chemistry and Doctor of Philosophy (Chemistry) are also offered.

A student beginning undergraduate work will begin with CHEM 105. Student without high school chemistry will begin their study with CHEM 101 prior to taking CHEM 105. Additionally, if a student has completed one year of Advanced Placement high school chemistry and has scored 5 on the Advanced Placement Exam, credit is granted for the CHEM 105 / 106 sequence. If a student has completed one year of advanced placement high school chemistry and has scored 3 or 4 on the Advanced Placement Exam, credit is granted for CHEM 105. Students who complete an International Baccalaureate program with a high level pass and a grade of 4 or more on the exam are given credit for CHEM 101.

The Department of Chemistry provides major parts of the course work leading to degrees in the Department of Biochemistry and Biophysics and the Program in Materials Science. Students whose interests span chemistry and biology or chemistry and physics should see the section on the appropriate program in this catalog.

Certification Requirements

A student may certify as a chemistry major after completing 30 credit hours, including CHEM 105 and 106 (or 116), each with a grade of C or better and MATH 171.

Lab Fees

Charges for expendable laboratory supplies and computing are made in each laboratory course.

Chemistry Options

After the beginning of the freshman year, a student interested in majoring in chemistry should consult

with chemistry advisors to arrange a schedule which will permit completion of required courses in proper sequence. The Department of Chemistry offers two BS degree options depending on the career goals of the student. These options are professional chemistry and materials chemistry. Both of these options leads to a degree for which students will be certified to the American Chemical Society and prepared for entry into the workforce or to pursue a graduate degree. Regardless of which option is chosen, a grade of C or better is required in all chemistry courses to fulfill requirements for the chemistry degree.

Student Learning Outcomes

Students graduating from the Chemistry Department will be able to demonstrate:

- A thorough knowledge of the basic principles of chemistry, including atomic and molecular structure, chemical dynamics and the chemical and physical properties of substances.
- A thorough knowledge of the subfields of chemistry, including analytical, inorganic, organic, biochemistry, and physical chemistry.
- The ability to read, critically evaluate and interpret numerical, chemical and general scientific information.
- The ability to communicate effectively about chemistry both verbally and in writing.
- The ability to design experiments and to use appropriate experimental apparatus effectively.
- Experience in the pursuit of an individual research experience.
- The opportunity to acquire the knowledge and skills needed to succeed in the workplace or in professional school after graduation.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

CHEMISTRY - MATERIALS OPTION (120 HOURS)

The requirements for all chemistry options are the same through the first semester of the junior year.

First Year

<i>First Term</i>	<i>Hours</i>
CHEM 105 [PSCI] ¹	4
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3
MATH 171 [QUAN]	4

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 102 [BSCI], 106 [BSCI], or 107 [BSCI]	4
CHEM 106 ¹	4
HISTORY 105 [ROOT]	3
MATH 172	4

Second Year

<i>First Term</i>	<i>Hours</i>
CHEM 345	4
Humanities [HUM]	3
MATH 220	2
MATH 273	2
PHYSICS 201	4

<i>Second Term</i>	<i>Hours</i>	CHEM 106 ¹	4
CHEM 220	2	ENGLISH 101 [WRTG]	3
CHEM 347	3	MATH 172	4
CHEM 348	4		
PHYSICS 202	4		
Social Sciences [SSCI]	3		
Complete Writing Portfolio			

Third Year

<i>First Term</i>	<i>Hours</i>	<i>First Term</i>	<i>Hours</i>
CHEM 222	2	CHEM 345	4
CHEM 330	1	Humanities [HUM]	3
CHEM 331	3	MATH 220	2
CHEM 370 or MBIOS 303	3 or 4	MATH 273	2
CHEM 398	1	PHYSICS 201	4
Diversity [DIVR]	3		
Foreign Language (if needed)	0-4		

<i>Second Term</i>	<i>Hours</i>	<i>Second Term</i>	<i>Hours</i>
CHEM 332	3	CHEM 220	2
CHEM 333 or 335	1	CHEM 347	3
Computational Elective: Math 300 [M] or course approved by advisor	3	CHEM 348	4
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3	PHYSICS 202	4
MSE 201	3	Social Sciences [SSCI]	3
Foreign Language, if necessary, or Elective	3 or 4	Complete Writing Portfolio	

Fourth Year

<i>First Term</i>	<i>Hours</i>	<i>Second Term</i>	<i>Hours</i>
CHEM 334 [M]	2	CHEM 332	3
CHEM 401	3	CHEM 333 or 335	1
CHEM 480	3	CHEM 425	2
CHEM 499	2	CHEM 499 or Elective	1
MSE 302	3	Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
MSE 320 [M]	3	Electives	6

<i>Second Term</i>	<i>Hours</i>	<i>Fourth Year</i>	
CHEM 410 [M]	3	<i>First Term</i>	<i>Hours</i>
CHEM 495	1	CHEM 334 [M]	2
ENGLISH 301 [WRTG], 402 [WRTG] [M], or Communication [COMM]	3	CHEM 401	3
Integrative Capstone [CAPS]	3	CHEM 426	2
MSE 321	3	CHEM 499	2
Elective ²	2	Foreign Language and/or Electives	6

¹ Students who have taken CHEM 101 must take CHEM 105 and 106, or 102 and 106. Highly qualified students are encouraged to take CHEM 116 in place of CHEM 106.

² CHEM 503 or any 300-400-level MSE course not used to satisfy major requirements.

CHEMISTRY - PROFESSIONAL OPTION (120 HOURS)

The requirements for all chemistry options are the same through the first semester of the junior year.

First Year

<i>First Term</i>	<i>Hours</i>
CHEM 105 [PSCI] ¹	4
Creative & Professional Arts [ARTS]	3
HISTORY 105 [ROOT]	3
MATH 171 [QUAN]	4

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 102 [BSCI], 106 [BSCI], or 107 [BSCI]	4

Second Year

<i>First Term</i>	<i>Hours</i>
CHEM 345	4
Humanities [HUM]	3
MATH 220	2
MATH 273	2
PHYSICS 201	4

<i>Second Term</i>	<i>Hours</i>
CHEM 220	2
CHEM 347	3
CHEM 348	4
PHYSICS 202	4
Social Sciences [SSCI]	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
CHEM 222	2
CHEM 330	1
CHEM 331	3
CHEM 370 or MBIOS 303	3 or 4
CHEM 398	1
Diversity [DIVR]	3

<i>Second Term</i>	<i>Hours</i>
CHEM 332	3
CHEM 333 or 335	1
CHEM 425	2
CHEM 499 or Elective	1
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
Electives	6

Fourth Year

<i>First Term</i>	<i>Hours</i>
CHEM 334 [M]	2
CHEM 401	3
CHEM 426	2
CHEM 499	2
Foreign Language and/or Electives	6

<i>Second Term</i>	<i>Hours</i>
Advanced CHEM Electives ²	3
CHEM 410 [M]	3
CHEM 495	1
ENGLISH 301 [WRTG], 402 [WRTG] [M], or Communication [COMM]	3
Integrative Capstone [CAPS]	3
Foreign Language or Electives	3 or 4

¹ Students who have taken CHEM 101 must take CHEM 105 and 106, or 102 and 106. Highly qualified students are encouraged to take CHEM 116 in place of CHEM 106.

² Advanced CHEM Electives include: CHEM 490, MATH 315, or any 500-level CHEM course.

Minors**Chemistry**

The minor in chemistry requires at least 16 hours selected from the courses below. All courses used for the minor must be completed with a grade of

C or better. At least 9 of the hours must be upper-division taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. Courses must be selected from at least two of the following areas (note that some courses have prerequisites): Organic: CHEM 345, 346, 347, 348, 370, 540. Analytical: CHEM 220, 222, 425, 426, 520. Physical/Inorganic: CHEM 330, 331, 332, 333, 334 [M], 401, 480, 501, 531. CHEM 499/495 – may be used for up to 4 hours. MBIOS 303 and other MBIOS courses may be substituted with approval.

Description of Courses**CHEMISTRY****CHEM**

101 [PSCI] Introduction to Chemistry 4
(3-3) Course Prerequisite: MATH 103, or placement into MATH 105, a minimum ALEKS math placement score of 45%, or concurrent enrollment in or credit for MATH 105, 106, 107, 108, 140, 171, 172, 182, 201, 202, ENGR 107, STAT 205 or 212. Basic chemical concepts; atomic theory, periodicity, reaction stoichiometry, gases, solutions, acids, basis, pH, equilibrium, kinetics, energy, applications to life sciences.

102 Chemistry Related to Life Sciences 4
(3-3) Course Prerequisite: CHEM 101 with a C or better, or CHEM 105 with C or better. Organic functional groups and their reactions; polymers, macro-molecules; carbohydrates, lipids, proteins, enzymes, nucleic acids, hormones, applications to life sciences.

105 [PSCI] Principles of Chemistry I 4 (3-3)
Course Prerequisite: Credit for or concurrent enrollment in one of the following courses: MATH 106, 108, 140, 171, 172, 182, 202, or ENGR 107, or a minimum ALEKS math placement score of 80%. Stoichiometry, structure, gases, liquids, solids, solutions, thermodynamics, kinetics, equilibrium, volumetric, and gravimetric analysis. Recommended preparation: One year high school chemistry or CHEM 101.

106 Principles of Chemistry II 4 (3-3)
Course Prerequisite: CHEM 105 with a grade of C or better; MATH 106, 107, or 108 with a grade of C or better, or MATH 108 or concurrent enrollment, or a minimum ALEKS math placement score of 80%. Acid-base, ionic, molecular, solubility, oxidation/reduction equilibria; kinetics, electrochemistry; systematic chemistry of the elements; coordination compounds. Credit not granted for both CHEM 106 and 116.

116 Chemical Principles Honors II 4
(3-3) Course Prerequisite: By department permission. Descriptive inorganic chemistry, organic chemistry principles, acid/base, ionic and molecular equilibrium, electrochem, thermodynamics, kinetics. Laboratory interfaced with computers. Credit not granted for both CHEM 106 and 116.

- 191 Independent Study in Modern Chemistry** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: CHEM 101 or concurrent enrollment, or CHEM 105 or concurrent enrollment. Independent study in the theory and practice of modern chemistry; written report required. S, F grading.
- 220 Quantitative Analysis 2** Course Prerequisite: CHEM 106 or 116. Theories of quantitative chemical analysis; statistical evaluation of data; chemical equilibrium; volumetric and gravimetric methods of analysis; introduction to electrochemistry.
- 222 Quantitative Analysis Laboratory 2** (0-6) Course Prerequisite: CHEM 220 or concurrent enrollment. Application of classical methods in volumetric and gravimetric analysis; acid-base, redox and EDTA titrations; ion-exchange chromatography; introduction to spectrophotometry.
- 301 Descriptive Inorganic Chemistry 3** Course Prerequisite: CHEM 106 with a C or better. A survey of the chemistry of the elements using basic principles of bonding, acid-base and oxidation-reduction chemistry, and thermodynamics.
- 330 Problem Solving in Physical Chemistry 1** Course Prerequisite: CHEM 106 or 116 with a C or better; MATH 273 or 283 with a C or better. Quantitative methods of data analysis and chemical concept development; emphasis on multivariable, matrix, and computer methods.
- 331 Physical Chemistry 3** Course Prerequisite: MATH 273 or 283 with a C or better; PHYSICS 202 with a C or better. Concepts of physical chemistry; basic thermodynamics; free energy and entropy; phase equilibria; properties of solutions of electrolytes and non-electrolytes.
- 332 Physical Chemistry 3** Course Prerequisite: MATH 273 with a C or better; MATH 220 with a C or better; PHYSICS 202 with a C or better. Elementary quantum theory; molecular structure and spectra; bonding theory; reaction rates; photochemistry and radiation chemistry; energy states and statistical thermodynamics.
- 333 Physical Chemistry Laboratory for Chemists 1** (0-3) Course Prerequisite: CHEM 331 with a C or better or concurrent enrollment. Experiments selected to meet the individual needs of students in biology, civil engineering, chemistry, or materials science.
- 334 [M] Physical Chemistry Laboratory 2** (0-6) Course Prerequisite: CHEM 332 with a C or better or concurrent enrollment; CHEM 333 with a C or better. Continuation of CHEM 333. Experiments in molecular structure, atomic molecular spectroscopy, chemical kinetics including computational methods.
- 335 Physical Chemistry Laboratory for Chemical Engineers 1** (0-3) Course Prerequisite: CHEM 331 with a C or better or concurrent enrollment. Experiments selected to meet the needs of students majoring in chemical engineering.
- 338 Physical Chemistry for Chemical Biology 3** Course Prerequisite: CHEM 345 with a C or better; MATH 140 with a C or better, or MATH 171 with a C or better; PHYSICS 101 with a C or better, or PHYSICS 102 with a C or better. The modern tools and insights of physical chemistry are covered by interconnecting these fundamental concepts with key biological phenomena.
- 345 Organic Chemistry I 4** (3-3) Course Prerequisite: CHEM 102 with a C or better, or CHEM 106 with a C or better. Survey of organic chemistry providing an overview of the chemistry of the functional groups.
- 346 Organic Chemistry II 3** Lecture-only component of CHEM 348. Advanced concepts in organic chemistry including mechanisms and multistep-synthesis. Credit not granted for both CHEM 346 and 348.
- 347 Organic Qualitative Analysis Laboratory 3** (1-6) Course Prerequisite: CHEM 345 with a C or better. Isolation, purification and identification of unknown compounds; for chemistry and biochemistry majors.
- 348 Organic Chemistry II and Problem Solving 4** (3-2) Course Prerequisite: CHEM 345 with a C or better. Advanced concepts in organic chemistry including mechanisms and multistep-synthesis; problem analysis and critical thinking development in organic chemistry. Credit not granted for both CHEM 346 and 348.
- 350 Chemistry in Contemporary Society 4** (3-3) Course Prerequisite: Junior standing. Principles and applications of chemistry in the context of contemporary society.
- 370 Chemical Biology 3** Course Prerequisite: CHEM 102 or 345 with a C or better. Exploration of the chemistry of biological systems with regards to structure and function relations, as well as metabolism and energy production.
- 398 Undergraduate Seminar 1** S, F grading.
- 401 Modern Inorganic Chemistry 3** Course Prerequisite: CHEM 332 with a C or better or concurrent enrollment. Properties of substances; periodic systems; oxidation-reduction and acid-base characteristics interpreted on the basis of atomic and molecular structure.
- 410 [M] Advanced Synthesis and Characterization 3** (1-6) Course Prerequisite: CHEM 346 with a C or better, or CHEM 348 with a C or better; CHEM 332 with a C or better. Synthesis and characterization of organic and inorganic compounds and solid-state materials; modern synthetic technology, characterization methods, and laboratory techniques.
- 425 Quantitative Instrumental Analysis 2** Course Prerequisite: CHEM 332 with a C or better or concurrent enrollment. Computer interfacing applicable to chemical instrumentation; principles and applications of modern chromatography, spectrophotometry and electrochemical techniques.
- 426 Quantitative Instrumental Analysis Laboratory 2** (0-6) Course Prerequisite: CHEM 425 with a C or better or concurrent enrollment. Laboratory experience in modern analytical methods.
- 480 Solid State Chemistry 3** Course Prerequisite: CHEM 332 with a C or better. Properties, bonding and synthesis of solid state material; crystalline and amorphous solids and coatings.
- 485 [CAPS] [M] Senior Thesis in Chemistry 3** Course Prerequisite: Certified major in Chemistry; senior standing. Required capstone course for chemistry majors culminating in the development of a written research thesis.
- 490 Current Topics in Chemistry V 1-3** May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: By department permission. Recent advances in the understanding and application of chemical systems.
- 495 Directed Research 1** Course Prerequisite: By department permission. Poster presentation of final research project.
- 499 Special Problems V 1-4** May be repeated for credit. Course Prerequisite: By department permission. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 501 Advanced Inorganic Chemistry I 3** Periodic table survey, typical compounds and their reactivity; models and reactivity, acid-base, oxidation-reduction, and electronic structure contributions.
- 503 Advanced Topics in Inorganic Chemistry V 1-3** May be repeated for credit. Recent significant developments. Cooperative: Open to UI degree-seeking students.
- 509 Chemical Group Theory 3** Mathematical definitions of groups and representations, applications to chemical structure and spectra, ligand field theory, chemical reactions and selection rules.
- 510 Introduction to Proteomics 2** Techniques and applications for the analysis of the proteome. Recommended preparation: MBIOS 303 or equivalent.
- 514 Mass Spectrometry 2** Current methods, techniques and interpretation of mass spectrometric analysis. Recommended preparation: CHEM 425 or equivalent.
- 517 Chromatography 2** Recommended preparation: CHEM 425 or equivalent.
- 518 Electrochemistry 2** Recommended preparation: CHEM 425 or equivalent.
- 520 Advanced Analytical Chemistry 3** Statistics in chemical analysis; sampling; control of contamination and losses in analysis; electrochemical methods; separation in analysis; spectroscopic techniques. Recommended preparation: CHEM 425 or equivalent.

- 521 Radiochemistry and Radiotracers 2**
Recommended preparation: CHEM 425 or equivalent.
- 522 Radiochemistry Laboratory 1 (0-3)**
Required preparation must include CHEM 222, CHEM 331, and PHYSICS 202 or equivalent.
- 527 Environmental Chemistry 2** Natural water chemistry, AGRI processes, kinetics, thermodynamics, modeling in lake, river, and sea water.
- 529 Selected Topics in Analytical Chemistry V 1-3** May be repeated for credit. Selected current developments.
- 531 Advanced Physical Chemistry I 3**
Classical physical chemistry including basic thermodynamics and kinetics; an introductory discussion of surface chemistry and electrochemistry. Recommended preparation: CHEM 331 or equivalent.
- 532 Advanced Physical Chemistry II 3**
Introduction to quantum mechanics; postulates of quantum mechanics; exact solutions and approximation methods. Recommended preparation: CHEM 332 or equivalent.
- 534 Chemical Statistical Mechanics 3**
Statistical theory of thermodynamic variables and chemical equilibrium; calculation of equilibrium properties from spectral data; fluctuations about equilibrium; quantum statistics.
- 535 Applied Spectroscopy 3** Application of optical (UV-visible, Fourier transform infrared, Raman, and fluorescence) and NMR spectroscopies to problem solving in chemical research. Recommended preparation: CHEM 331, 332, 345, and 425.
- 536 Quantum Chemistry 3** Course Prerequisite: CHEM 532. Quantum mechanics applied to chemical problems: states of atoms and molecules, transitions and spectra, ladder operators and many electron methods.
- 537 Advanced Topics in Physical Chemistry V 1-3** May be repeated for credit. Selected subjects; irreversible thermodynamics; chemical bonding; NMR; ligand field theory; x-ray diffraction; neutron diffraction. Cooperative: Open to UI degree-seeking students.
- 540 Physical Organic Chemistry 3** Course Prerequisite: CHEM 542. The major classes of organic reaction mechanisms and their significance; kinetics and introductory theory. Cooperative: Open to UI degree-seeking students.
- 542 Advanced Organic Chemistry 3** Synthesis of organic compounds; recent developments from current literature.
- 543 Bioorganic Chemistry 3** Course Prerequisite: CHEM 542. Chemistry of biological systems, medicinal chemistry, protein chemistry, enzyme mechanisms and inhibitors.
- 544 Advanced Topics in Organic Chemistry V 1-3** May be repeated for credit. Current research in organic chemistry. Cooperative: Open to UI degree-seeking students.
- 545 Synthetic Organic Chemistry 3** Course Prerequisite: CHEM 542. Modern synthetic methods and strategies; detailed reaction mechanisms, reaction scope and issues in catalysis will be discussed. Cooperative: Open to UI degree-seeking students.
- 546 Spectroscopic Identification of Organic Compounds 3** Structural interpretation of mass spectrometry and IR, UV-VIS and NMR spectrometry of small molecule organic compounds.
- 550 Special Topics in Nuclear Processes and Radioactive Waste Management V 1-3** May be repeated for credit; cumulative maximum 6 hours. Fundamental chemistry of the nuclear industry, chemical processing and waste management.
- 555 Teaching Chemistry 1** Teaching chemistry; workshops for new graduate teaching assistants in chemistry focusing on tutorials and labs.
- 564 Molecular Phenomena 3** Phenomena which yield information on structures, energy levels, and interactions of molecules in solid, liquid, and gaseous phases.
- 572 Enzyme Reaction Mechanisms 3** Course Prerequisite: CHEM 542. Methods used to explore enzyme mechanisms; how enzymes catalyze reactions; overview of enzyme co-factors and exploration of differing classes of enzyme catalyzed reactions.
- 581 Environmental Chemistry I 3** Chemistry of natural and pollutant species and their reactions in the atmospheric environment.
- 590 Introduction to Research Topics 1** Presentation and description of research areas and projects of current interest to faculty. S, F grading.
- 591 Seminar in Inorganic Chemistry 1** May be repeated for credit; cumulative maximum 6 hours. Presentation and discussion of topics in inorganic chemistry taken from research in progress or current literature.
- 592 Seminar in Analytical Chemistry 1** May be repeated for credit; cumulative maximum 6 hours. Presentation and discussion of topics in analytical chemistry taken from research in progress or current literature.
- 593 Seminar in Physical Chemistry 1** May be repeated for credit; cumulative maximum 6 hours. Presentation and discussion of topics in physical chemistry taken from research in progress or current literature.
- 594 Seminar in Organic Chemistry 1** May be repeated for credit; cumulative maximum 6 hours. Presentation and discussion of topics in organic chemistry taken from research in progress or current literature.
- 600 Special Projects or Independent Study V 1-18** May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.

700 Master's Research, Thesis, and/or Examination V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

702 Master's Special Problems, Directed Study, and/or Examination V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Chemistry PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Department of Civil and Environmental Engineering

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Professor and Department Chair, B. Muhunthan; Professors, D. A. Bender, J. Boll, C. S. Claiborn, W. F. Cofer, J. D. Dolan, T. Ginn, L. Haselbach, M. A. Hossain, B. T. Jobson, B. K. Lamb, P. Qiao, V. P. Walden, R. J. Watts, M. P. Wolcott, D. R. Yonge; Associate Professors, J. C. Adam, H. Liu, K. Olsen, X. Shi, T. VanReken, H. Wen, V. Yadama; Assistant Professors, S. Allena, S. Amarasiri, I. Chowdhury, Y. Demissie, N. B. Engdahl, A. Hajbabaie, L. Hajibabai, O. Harldsson, C.R. McGann, A. Mohebbi, S. Nassiri, J. Petrie; Clinical Associate Professor, K. Olsen; Associate Research Professors, S. Chung, K. Englund, S. N. Pressley, A. Teel, J. Vaughan; Clinical Assistant Professor, M.T. Khan; Assistant Research Professor, M. L. Liu; Visiting Professor, M. Ranaweera; Senior Instructor, R. Petersen; Instructor, C.N. Morton.

Civil engineers plan, design, construct, and operate the physical works and facilities essential to modern life. Civil engineers are responsible not only for creating the facilities required by a modern civilization, but also are committed to the conservation and preservation of the environment. Examples of these facilities include bridges, highways, buildings, airports, flood control structures, purification plants for drinking water, waste treatment and disposal facilities, offshore structures, tunnels, irrigation systems, space satellites, and launching facilities.

The program leading to the Bachelor of Science degree in Civil Engineering is accredited by the

Engineering Accreditation Commission (EAC) within ABET, which is the nonprofit, non-governmental organization that accredits college and university programs in the disciplines of applied science, computing, engineering, and engineering technology.

The mission of the undergraduate program of the Department of Civil and Environmental Engineering is to provide a premier undergraduate education in civil engineering that prepares our graduates to contribute effectively to the profession and society, for advanced study, and for life-long learning; to conduct world-class disciplinary and interdisciplinary research that is integrated with both graduate and undergraduate education in selected areas of excellence; and to serve a diverse constituency through technology transfer, public service, and outreach.

Student Learning Outcomes

The objectives for graduates of our undergraduate program are as follows: 1) that they engage in entry-level engineering or related employment or advanced education; 2) that they demonstrate competence and ongoing development in their technical and professional skills; 3) that they demonstrate continued growth in effective communication; 4) that they pursue their careers with integrity, service, and professionalism; and 5) that they continue learning and they grow into positions of responsibility.

Courses can be selected to provide in-depth studies in environmental, infrastructure, water resource, structural, and construction.

Because design and planning are essential in the civil engineering profession, these activities are introduced in early CE courses. As students advance, they face open-ended assignments with alternative solutions, feasibility studies, safety considerations, economics, social and environmental impacts, and other concerns that test their creative ability. All students complete a senior capstone design class in which much of earlier course work is applied.

All seniors are required to take the Fundamentals of Engineering (FE) exam prior to graduation. Two purposes of this exam are: (1) It is a required step in becoming a licensed professional engineer; and (2) It serves as an assessment tool for meeting the department's objectives.

Because of the ever-increasing knowledge required to practice at high levels of competence in the specialized branches of civil engineering, an educational preparation of five or more years of college study is becoming more important. By an appropriate choice of electives the undergraduate curriculum may be integrated with a graduate program to provide a continuous schedule of studies leading to both the bachelor's and master's degrees.

The department offers courses of study leading to the degrees of Bachelor of Science in Civil Engineering, Master of Science in Civil Engineering, Master of Science in Environmental Engineering, and Doctor of Philosophy (Civil Engineering). The department also participates in interdepartmental programs leading to the degrees of Master of Science in Environmental Science, and Master of Regional Planning.

Computer Requirement

All incoming Civil and Environmental Engineering

students are required to purchase laptop computers. Please contact the department for details and specifications and/or visit: http://www.ce.wsu.edu/laptop_requirements.htm.

Transfer Students

Students who are planning to transfer to civil engineering at Washington State University from other institutions should coordinate their program with the department chairperson to establish an integrated program leading to the bachelor's degree. Inquiries concerning specific questions are welcome. A strong preparation in mathematics and physics is necessary prior to transfer to minimize the time required to complete the degree requirements. The requirements for direct entry into the Department of Civil and Environmental Engineering upon transfer are the same as listed for certification under the Degree Programs. The Admissions Office will handle admissions applications from transfer students and the Department of Civil and Environmental Engineering will handle certification applications.

Preparation for Graduate Study

As preparation for academic work toward an advanced degree in civil engineering or environmental engineering, a student should have completed substantially the equivalent of the schedule of studies. For details on specific requirements for the various areas of specialty, visit <http://www.ce.wsu.edu/Grads/ceDef.htm>.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

CIVIL ENGINEERING (127 HOURS)

At least 50 of the total hours required for this degree must be in 300-400-level courses. None of the courses listed below may be taken on a pass, fail basis and a grade of C or better in all CE courses used to fulfill major requirements is required for graduation.

Certification Requirements:

Students who will be completing at least 45 semester hours of course work at the end of the semester including CE 211, MATH 171, 172, and PHYSICS 201 or equivalents are eligible to apply for certification into the Department of Civil and Environmental Engineering. The number of students certified into the department depends upon the available resources and facilities. The best qualified students, based on cumulative GPA and grades in the prerequisite courses listed above, as well as all math, science and engineering courses taken to date, will be certified into the department until the carrying capacity is reached.

Experiential Requirement

Students within the Department of Civil and Environmental Engineering must complete one of the following experiential requirements:

1. An internship of at least eight weeks duration, with at least one credit of CE 495.
2. A research position of at least eight weeks duration under the supervision of a departmental

faculty member or approved mentor, with at least one credit of CE 499.

3. Study abroad for six or more credit hours. International students in the Department of Civil and Environmental Engineering will meet this requirement through their study in the United States.

4. Participation in a recognized ROTC program. Veterans in the Department of Civil and Environmental Engineering will have met this requirement through their prior service in the armed forces.

5. A leadership or service experience of at least one semester, subject to departmental approval, with at least one credit of CE 499.

First Year

<i>First Term</i>	<i>Hours</i>
CHEM 105 [PSCI]	4
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3
ENGR 120	2
MATH 171 [QUAN] ¹	4

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 102 [BSCI] or MBIOS 101 [BSCI]	4
ECONS 101 [SSCI] or 102 [SSCI]	3
HISTORY 105 [ROOT]	3
MATH 172 ¹	4
MATH 220	2

Second Year

<i>First Term</i>	<i>Hours</i>
CE 211 ¹	3
COM 102 [COMM] or H D 205 [COMM]	3
Diversity [DIVR]	3
MATH 273	2
PHYSICS 201 [PSCI] ¹	4

<i>Second Term</i>	<i>Hours</i>
C E 215	3
CHEM 106, GEOLOGY 102, or PHYSICS 202 ²	4
E E 221	2
MATH 360 or 370	3
ME 212	3
ME 220	1
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
CE 302	2
CE 315	3
CE 317 [M]	3
CE Breadth Electives ³⁴	6
CST M 254	2

<i>Second Term</i>	<i>Hours</i>
CE 303	2
CE Breadth Electives ³⁴	6
E E 304 or ME 301	2
ENGLISH 402	3
MATH 315	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
CE 463	3
CE 480 [M]	1
CE Electives ⁵⁴	9
CE Laboratory Elective ⁶	3

<i>Second Term</i>	<i>Hours</i>
CE 465 [CAPS] [M] ⁷	3
CE 466	1
CE Electives ^{5,4}	9
Humanities [HUM]	3
Complete Experiential Requirement	
Exit Interview	

¹ Classes that must be completed prior to certification.

² CHEM 106 strongly recommended for students emphasizing environmental engineering; GEOLOGY 102 strongly recommended for students emphasizing structural, geotechnical, or infrastructure engineering.

³ CE Breadth Electives: Choose three courses from CE 322, 330, 341 and 351 and one other upper-division CE elective not including 495, 499 or any course used to fulfill a major requirement.

⁴ CE Electives and CE Breadth Electives: One course must be chosen from CE 341, 401, 403, 405, 433, 436, 450, 472, 473, or 476, which are designated as having a sustainability component.

⁵ CE Elective courses: The 18-credit hours for elective courses must be distributed such that at least three courses, not including the lab, are designated as having design emphasis. Those design courses must be selected such that at least one is chosen from two different areas of study, which include Environmental (CE 401, 402, 403, 415, 418, 419, and 442); Geotechnical (CE 400, 425 and 435); Hydraulics (CE 416, 450, 451, 456, 460, and 475); Structural (CE 414, 430, 431, 433, 434, and 436); Sustainability (CE 405 and 456); and Transportation/Pavement (CE 400, 473, and 476); Other approved courses include: CE 400, 401, 402, 403, 405, 414, 415, 416, 418, 419, 425, 430, 431, 433, 434, 435, 436, 442, 450, 451, 456, 460, 473, 475, 476, 498, 502, 503, 505, 515, 518, 519, 525, 534, 551, 560, CST M 356, 462, 466 or as approved by advisor.

⁶ CE Laboratory Elective: Choose one from CE 400, 414, 415, or 416.

⁷ Course to be taken in final semester. With permission of advisor, student may substitute ENGR 421 or 431 for CE 465.

CONSTRUCTION ENGINEERING (129 HOURS)

Certification Requirements: Certification into the Bachelor of Science in Construction Engineering requires the completion of 24 total credits, CHEM 105, MATH 171 and MATH 172 with a grade of C or better, and an application to the Construction Engineering Program. The best qualified students based on cumulative GPA and grades in the prerequisite courses will be certified until the departmental limit is reached.

First Year

<i>First Term</i>	<i>Hours</i>
CHEM 105 [PSCI]	4
ECONS 101 [SSCI]	3
HISTORY 105 [ROOT]	3
HUMANITIES [HUM]	3
MATH 171 [QUAN] ¹	4

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 102 [BSCI] or MBIOS 101[BSCI]	4
Creative & Professional Arts [ARTS]	3

CST M 102	2
ENGLISH 101 [WRTG]	3
MATH 172 ¹	4

Second Year

<i>First Term</i>	<i>Hours</i>
B LAW 210	3
CE 2111	3
CST M 254	2
Diversity [DIVR]	3
PHYSICS 201 ¹	4

<i>Second Term</i>	<i>Hours</i>
ACCTG 230	3
CE 215	3
CON E 252	4
ME 212	3
ME 220	1
STAT 360 or 370	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
CE 302	2
CE 315	3
CE 330	3
CON E 360	3
CST M 356	3
ENGLISH 402 [WRTG]	3

<i>Second Term</i>	<i>Hours</i>
CE 303	2
CE 317 [M]	4
CE 433	3
CON E 361	3
CST M 368	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
CE 400	3
CE 463	3
CE 466	1
CST M 460	3
CST M 462	3
Professional Electives ²	3

<i>Second Term</i>	<i>Hours</i>
CE 465 [M] [CAPS] ³	3
CE 480	1
CST M 451	3
CST M 473	3
Professional Electives ²	6
Con E Exit Survey	

¹ Classes that must be completed prior to certification.

² Professional Electives (9 credits required): Students must choose an area of emphasis and complete the required courses and additional professional electives: 1) Structures/Buildings: CE 431, 436; 2) Infrastructure/Pavement: CE 322, 473; 3) Foundations/Heavy Civil: CE 435; 4) Environmental Facilities: CE 341, 442. Additional professional electives included any 300-400-level CE, CST M or CON E course not used to fulfill major requirements.

³ CE 465 [M] [CAPS] must be taken in the final semester.

Description of Courses

CIVIL ENGINEERING

CE

211 Statics 3 Course Prerequisite: MATH 172 or concurrent enrollment, or MATH 182 or concurrent enrollment; PHYSICS 201 or concurrent enrollment, or PHYSICS 205 or concurrent enrollment. Engineering mechanics concepts; force systems; static equilibrium; centroids, centers of gravity; shear and moment diagrams; friction; moments of inertia. Cooperative: Open to UI degree-seeking students.

215 Mechanics of Materials 3 Course Prerequisite: CE 211 with a C or better. Concepts of stress, strain, and their relationships; axial loads, torsion and bending; combined stress; properties of materials; columns, repeated loadings. Cooperative: Open to UI degree-seeking students.

302 Introduction to Surveying 2 (1-3) Course Prerequisite: MATH 171; certified Civil Engineering or Construction Management major. Surveying data collection, analysis and application; measuring distances and angles using total stations and global positioning systems; analysis of errors in measurements.

303 Civil Engineering Computer Applications 2 (1-3) Course Prerequisite: Certified major in Civil Engineering. Advanced civil engineering computer applications including Geographical Information Systems, Revit, and Excel.

315 Fluid Mechanics 3 Course Prerequisite: ME 212; certified major in Civil Engineering. Fluid statics, laminar and turbulent flow, similitude, pipe flow, boundary layer, lift and drag and measurement techniques.

317 [M] Geotechnical Engineering I 4 (3-3) Course Prerequisite: CE 215 with a C or better; CE 315 or concurrent enrollment; certified major in Civil Engineering. Structure, index properties, and classification of soils; compaction; effective stress; seepage; consolidation and shear strength.

322 Transportation Engineering 3 Course Prerequisite: STAT 360 or concurrent enrollment or STAT 370 or concurrent enrollment; CE 302 or concurrent enrollment; certified major in Civil Engineering. Road-vehicle interaction, geometric design, traffic flow and queuing theory, highway capacity and level of service, and introduction to pavement design and materials.

330 Introduction to Structural Engineering 3 Course Prerequisite: CE 215 with a C or better; certified major in Civil Engineering. Introduction to structural analysis and design; structural modeling; design philosophies; deflections; indeterminate analysis by the Force Method.

341 Introduction to Environmental Engineering 3 Course Prerequisite: CHEM 105. Impact of pollutants on the environment; pollution sources and sinks; engineering aspects of air and water quality; introduction to pollution control.

- 351 Water Resources Engineering** 3 Course Prerequisite: CE 315 with a C or better; certified major in Civil Engineering. Application of fluid mechanics to hydraulic infrastructure, principles of open channel flow, and introduction to surface and ground water hydrology.
- 400 Highway Materials Engineering** 3 (2-3) Course Prerequisite: STAT 360 or concurrent enrollment or STAT 370 or concurrent enrollment; senior standing; certified major in Civil Engineering. Basic properties and mix designs of aggregates, asphalt, concrete and recycled materials; quality assurance, quality control.
- 401 Climate Change Science and Engineering** 3 Course Prerequisite: CHEM 105; MATH 172; PHYSICS 201. Engineering solutions for climate change problems; basic science of climate change, engineering for mitigation and adaptation, and climate change policy.
- 402 Applied Meteorology** 3 Course Prerequisite: MATH 172 or 182; PHYSICS 201. Atmospheric physical behavior across spatial scales linking concepts of meteorological phenomena to engineering design principles. Credit not granted for both CE 402 and CE 502. Cooperative: Open to UI degree-seeking students.
- 403 Air Quality Management** 3 Air pollution from the perspective of an environmental manager; regulatory framework, management strategies, monitoring, modeling tools, and control technologies. Cooperative: Open to UI degree-seeking students.
- 405 Sustainability: Green Engineering** 3 Course Prerequisite: Senior standing; certified major in Architecture, Construction Management, Civil Engr, Electrical Engr, Bioengineering, Chemical Engr, Mechanical Engr, Computer Science, Materials Science Engr, or Computer Engr. Focus on the LEED green building rating system with topics on sustainable site selection, alternative transportation, heat island effect, light pollution, water and energy efficiency/use, regional and global climate/air issues, use/reuse of many material and resources, and indoor environmental quality. Cooperative: Open to UI degree-seeking students.
- 414 Structural Design Laboratory** 3 (2-3) Course Prerequisite: CE 330; STAT 360 or concurrent enrollment, or STAT 370 or concurrent enrollment; certified major in Civil Engineering. Senior lab requiring integration of previous course work into the execution of design projects and the assessment of experimental test data; design codes and standards, load determination, load path, influence lines; applications in concrete, masonry, steel, and wood.
- 415 Environmental Measurements** 3 (1-6) Course Prerequisite: CE 341; STAT 360 or concurrent enrollment or STAT 370 or concurrent enrollment; certified major in Civil Engineering. Theory and laboratory measurement techniques used in analyzing environmental quality parameters. Credit not granted for both CE 415 and CE 515. Required preparation must include CE 341. Cooperative: Open to UI degree-seeking students.
- 416 Hydraulic Engineering Laboratory** 3 (1-6) Course Prerequisite: CE 315; STAT 360 or concurrent enrollment or STAT 370 or concurrent enrollment; certified major in Civil Engineering. Experiments related to fluid flow principles and their application to hydraulic engineering.
- 418 Hazardous Waste Engineering** V 3-4 Course Prerequisite: CE 341 with a C or better; certified major in Civil Engineering. Hazardous waste properties, chemodynamics, and health effects; introduction to risk assessment and hazardous waste remediation. Credit not granted for both CE 418 and CE 518. Cooperative: Open to UI degree-seeking students.
- 419 Hazardous Waste Treatment** 3 Course Prerequisite: CE 418 with a C or better; certified major in Civil Engineering. Principles of operation and application of processes in design of technologies used in hazardous waste treatment and remediation. Credit not granted for both CE 419 and CE 519. Cooperative: Open to UI degree-seeking students.
- 425 Soil and Site Improvement** 3 Course Prerequisite: CE 317 with a C or better; certified major in Civil Engineering. Compaction theory and methods; deep densification of soils; advanced consolidation theory, preloading, vertical drains, chemical stabilization, grouting; design with geosynthetics. Credit not granted for both CE 425 and CE 525. Required preparation must include CE 317. Cooperative: Open to UI degree-seeking students.
- 430 Analysis of Indeterminate Structures** 3 Course Prerequisite: CE 330 with a C or better; MATH 220; E E 221; certified major in Civil Engineering. Stiffness methods for the analysis of trusses, beams, and frames; matrix models; and computer applications.
- 431 Structural Steel Design** 3 Course Prerequisite: CE 330 with a C or better; CE 414; certified major in Civil Engineering. Design of steel structures by load and resistance factor design (LRFD); behavior and design of beams, columns, tension members and connections.
- 433 Reinforced Concrete Design** 3 Course Prerequisite: CE 330 with a C or better; CE 414; certified major in Civil Engineering. Behavior, analysis, and design of reinforced concrete structures; flexure; shear; bond; serviceability requirements; design of beams, columns, and slabs.
- 434 Prestressed Concrete and Reinforced Masonry Design** 3 Course Prerequisite: CE 433 with a C or better; certified major in Civil Engineering. Behavior, analysis, and design of pretensioned and post-tensioned prestressed concrete structures; behavior and design of reinforced masonry structures. Credit not granted for both CE 434 and CE 534. Cooperative: Open to UI degree-seeking students.
- 435 Foundations** 3 Course Prerequisite: CE 317 with a C or better; certified major in Civil Engineering. Site investigation; bearing capacity, settlement and design of shallow foundations, piles and piers; design of retaining walls.
- 436 Design of Timber Structures** 3 Course Prerequisite: CE 330 with a C or better; CE 414; certified major in Civil Engineering. Engineering properties of wood materials; analysis and design of members, connections, trusses, shearwalls and structural diaphragms; durability and moisture effects on engineered wood products. Cooperative: Open to UI degree-seeking students.
- 437 Structural Composites Design** 3 Course Prerequisite: CE 330. Behavior, analysis and design of fiber-reinforced plastic composite structures; micro, ply and laminate mechanics; reinforcement of concrete and wood.
- 442 Water and Wastewater Treatment Design** 3 Course Prerequisite: CE 341 with a C or better; certified major in Civil Engineering or Environmental Science. Water and wastewater treatment processes and design.
- 450 Water Resource Engineering Design** 3 Course Prerequisite: CE 351 with a C or better; certified major in Civil Engineering. Hydraulic design and planning of facilities associated with gravity controlled and pressurized flow. Cooperative: Open to UI degree-seeking students.
- 451 Open Channel Flow** 3 Course Prerequisite: CE 351 with a C or better; certified major in Civil Engineering. Steady, non-uniform flow; controls and transitions in fixed-bed channels. Credit not granted for both CE 451 and CE 551. Cooperative: Open to UI degree-seeking students.
- 456 Sustainable Development in Water Resources** 3 Course Prerequisite: CE 351 with a C or better; certified major in Civil Engineering. Sources of freshwater in Pacific Northwest; water demands; climate change impacts on water availability; approaches for developing sustainable water yield.
- 460 Advanced Hydrology** 3 Course Prerequisite: CE 351 with a C or better; certified major in Civil Engineering. Components of the hydrologic cycle; conceptual models; watershed characteristics; probability/statistics in data analysis; hydrographs; computer models; and design applications. Credit not granted for both CE 460 and CE 560. Cooperative: Open to UI degree-seeking students.

- 463 Engineering Administration** 3 Engineering economy; annual cost, present worth, rate of return, and benefit-cost ratio in engineering decision making; basic contract law.
- 465 [CAPS] [M] Integrated Civil Engineering Design** 3 (1-6) Course Prerequisite: Certified major in Civil Engineering; senior standing. Civil engineering applications to planning and design; problem synthesis, data analysis, decision making and reporting; design of complete projects that include local and world-wide problems through interdisciplinary teams.
- 466 Fundamentals of Engineering Examination Review** 1 Course Prerequisite: Senior standing; certified major in Civil Engr, Electrical Engr, Bioengineering, Chemical Engr, Mechanical Engr, Computer Science, Materials Science Engr, or Computer Engr. Review of topics to prepare for the Fundamentals of Engineering Examination. S, F grading.
- 472 Durable and Sustainable Pavements and Bridges** 3 Course Prerequisite: CE 215 with a C or better; certified major in Civil Engineering. Introduction to durability and sustainability concepts and practices related to pavements and bridges; deterioration mechanisms of Portland cement concrete and asphalt concrete; holistic perspectives for infrastructure management; effective materials and techniques for pavement and bridge preservation.
- 473 Pavement Design** 3 Course Prerequisite: CE 317; ECONS 101 or ECONS 102; CE 322 or concurrent enrollment. Pavement performance evaluation, material characterization, traffic analysis, pavement structural response analysis, transfer function application, and pavement design procedures for both flexible and rigid pavements.
- 475 Groundwater** 3 (2-3) Course Prerequisite: CE 317 or GEOLOGY 315; MATH 140 or concurrent enrollment, or MATH 172 or 182 or concurrent enrollment. Introduction to groundwater occurrence, movement, quality, and resource management, emphasizing physical and biogeochemical principles. Field trip required. (Crosslisted course offered as GEOLOGY 475, CE 475).
- 476 Pavement Evaluation and Rehabilitation** 3 Course Prerequisite: CE 317. Engineering concept and information needed to maintain, evaluate, repair and rehabilitate pavements and design of flexible and rigid overlays.
- 480 [M] Ethics and Professionalism** 1 Course Prerequisite: Certified major in Civil Engineering; senior standing. Professional aspects of civil engineering.
- 488 Professional Practice Coop/Internship I** V 1-2 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: By department permission. Practicum for students admitted to the VCEA Professional Practice and Experiential Learning Program; integration of coursework with on-the-job professional experience. (Crosslisted course offered as ENGR 488, BIO ENG 488, CHE 488, CE 488, CPT S 488, E E 488, ME 488, MSE 488, SDC 488). S, F grading.
- 495 Engineering Experience** V 1-4 May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: By interview only. Leadership, service, or professional experience commensurate with departmental requirements. S, F grading.
- 498 Special Topics in Civil Engineering** V 1-4 May be repeated for credit; cumulative maximum 6 hours. Contemporary topics in civil engineering.
- 499 Special Problems** V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 501 Advanced Topics in Transportation Engineering** V 2-4 May be repeated for credit; cumulative maximum 9 hours. Special topics course in transportation engineering. Cooperative: Open to UI degree-seeking students.
- 502 Applied Meteorology** 3 Atmospheric physical behavior across spatial scales linking concepts of meteorological phenomena to engineering design principles. Credit not granted for both CE 402 and CE 502. Cooperative: Open to UI degree-seeking students.
- 503 Air Quality Management** 3 Air pollution from the perspective of an environmental manager; regulatory framework, management strategies, monitoring, modeling tools, and control technologies. Cooperative: Open to UI degree-seeking students.
- 504 Sustainability Engineering I** 3 Green building and sustainable development topics including low impact development (LID) stormwater design and environmental life cycle assessment (LCA). Cooperative: Open to UI degree-seeking students.
- 505 Sustainability: Green Engineering** 3 Focus on the LEED green building rating system with topics on sustainable site selection, alternative transportation, heat island effect, light pollution, water and energy efficiency/use, regional and global climate/air issues, use/reuse of many material and resources, and indoor environmental quality. Cooperative: Open to UI degree-seeking students.
- 506 Theory and Measurement of Turbulent Fluxes** 3 Fundamental concepts of turbulence and turbulent fluxes in the atmospheric surface layer, the statistical description of turbulence and turbulent fluxes, eddy covariance systems, and post-filed processing of flux data.
- 507 Sustainability: Life Cycle Assessment** 3 Principles of life cycle assessment (LCA), environmental impacts categories, LCA system models, and methods for life cycle inventory. Cooperative: Open to UI degree-seeking students.
- 508 Concrete Durability** 3 Introduction to concrete durability, serviceability, and life cycle assessment; physical and chemical mechanisms of concrete degradation; corrosion of steel reinforcement in concrete; materials selection, specification, proportioning, and construction for durable concrete; testing and appraisal for durable concrete; and repair and rehabilitation of concrete structures.
- 509 Numerical Modeling of Geomaterials** 3 Modeling of the response of geomaterials to changes in imposed stresses or strains under both static and dynamic conditions. Cooperative: Open to UI degree-seeking students.
- 510 Advanced Geomaterial Characterization** 3 Advanced mechanics of geomaterials; compressibility, concept of stress and strain; shear strength, stress/strain and time-dependent behavior; dynamic properties. Cooperative: Open to UI degree-seeking students.
- 511 Advanced Topics in Geotechnical Engineering** V 2-4 May be repeated for credit; cumulative maximum 9 hours. Soil dynamics, theoretical soil mechanics, numerical methods in soil mechanics, and geohydrology, engineering geology, cold regions geoenvironment. Required preparation must include CE 317. Cooperative: Open to UI degree-seeking students.
- 512 Dynamics of Structures** 3 Equations of motion, free vibration, damping mechanisms, harmonic, impulse, and seismic loading; shock and seismic response spectra, time and frequency domain analysis, modal analysis, structural dynamics in building codes. Cooperative: Open to UI degree-seeking students.
- 514 Advanced Mechanics of Materials** 3 Elastic stress-strain relations, shear center, unsymmetrical bending, curved beams, elastic stability, elastically supported beams, energy methods, thin plates, shells. Cooperative: Open to UI degree-seeking students.
- 515 Environmental Measurements** 3 (1-6) Theory and laboratory measurement techniques used in analyzing environmental quality parameters. Credit not granted for both CE 415 and CE 515. Required preparation must include CE 341. Cooperative: Open to UI degree-seeking students.
- 517 Mechanics of Sediment Transport** 3 Cohesive and non-cohesive sediments; initiation of sediment motion; sediment transport; suspended and bed load entrainment; models of sediment transport for alluvial and gravel bed streams, sediment-flow interaction; river morphology and ecological restoration. Cooperative: Open to UI degree-seeking students.
- 518 Hazardous Waste Engineering** V 3-4 Hazardous waste properties, chemodynamics, and health effects; introduction to risk assessment and hazardous waste remediation. Credit not granted for both CE 418 and CE 518. Cooperative: Open to UI degree-seeking students.

- 519 Hazardous Waste Treatment** 3 Principles of operation and application of processes in design of technologies used in hazardous waste treatment and remediation. Credit not granted for both CE 419 and CE 519. Cooperative: Open to UI degree-seeking students.
- 524 Geotechnical Earthquake Engineering** 3 Faulting and seismicity; site response analysis; probabilistic seismic hazard assessment; influence of soil on ground shaking; response spectra; soil liquefaction; seismic earth pressures; seismic slope stability; earthquake resistant design. Cooperative: Open to UI degree-seeking students.
- 525 Soil and Site Improvement** 3 Compaction theory and methods; deep densification of soils; advanced consolidation theory, preloading, vertical drains, chemical stabilization, grouting; design with geosynthetics. Credit not granted for both CE 425 and CE 525. Required preparation must include CE 317. Cooperative: Open to UI degree-seeking students.
- 527 Engineering Properties of Soils** 3 Physical properties, compressibility and consolidation, shear strength, compaction, saturated and unsaturated soils, laboratory and field methods of measurement, relations of physical and engineering properties, introduction to critical-state soil mechanics. Required preparation must include CE 317. Cooperative: Open to UI degree-seeking students.
- 530 Advanced Design of Steel Structures** 3 Plate girder design; local and global buckling; plastic collapse analysis; shear and Moment-resisting connections; eccentrically-loaded connections. Required preparation must include CE 431. Cooperative: Open to UI degree-seeking students.
- 531 Probability and Statistical Models in Engineering** 3 Engineering applications of probability and statistics; Monte Carlo simulation; model estimation and testing; probabilistic characterizations of loads and material properties; risk and reliability analyses. Cooperative: Open to UI degree-seeking students.
- 532 Finite Elements** 3 Theory of finite elements; applications to general engineering systems considered as assemblages of discrete elements. (Crosslisted course offered as CE 532, ME 532). Cooperative: Open to UI degree-seeking students.
- 533 Advanced Reinforced Concrete Design** 3 Composite design; slab design; limit state design; footings; retaining walls; deep beams; brackets and corbels; torsion; seismic design; shear walls. Required preparation must include CE 433. Cooperative: Open to UI degree-seeking students.
- 534 Prestressed Concrete and Reinforced Masonry Design** 3 Behavior, analysis, and design of pretensioned and post-tensioned prestressed concrete structures; behavior and design of reinforced masonry structures. Credit not granted for both CE 434 and CE 534. Cooperative: Open to UI degree-seeking students.
- 535 Advanced Finite Elements** 3 Plate and shell analysis; nonlinear solution methods for finite strain/rotation and nonlinear materials. Cooperative: Open to UI degree-seeking students.
- 536 Nondestructive Testing of Structural Materials** 3 Principles of nondestructive testing applied to wood-based materials, steel, concrete, and masonry. Cooperative: Open to UI degree-seeking students.
- 537 Advanced Topics in Structural Engineering** 3 May be repeated for credit; cumulative maximum 9 hours. Elastic stability, plates and shells, other relevant topics. Cooperative: Open to UI degree-seeking students.
- 538 Earthquake Engineering** 3 Seismology, size of earthquakes, seismic ground motion, seismic risk, behavior of structures subjected to earthquake loading seismic response spectra, seismic design codes, lateral force-resisting systems, detailing for inelastic seismic response. Recommended preparation: CE 512. Cooperative: Open to UI degree-seeking students.
- 539 Advanced Design of Timber Structures** 3 Engineering properties of wood materials; theory and design of wood composites, connections and load-sharing systems; performance criteria and durability. Required preparation must include CE 436. Cooperative: Open to UI degree-seeking students.
- 540 Instrumental Analysis of Environmental Contaminants** 3 (1-6) Course Prerequisite: CE 515. Theory and methods of analysis of water and water suspensions for contaminants using electrometric, spectrophotometric, and chromatographic techniques. Cooperative: Open to UI degree-seeking students.
- 541 Physicochemical Water and Wastewater Treatment** 3 Principles of physical and chemical operations used in water and wastewater treatment, including chemical reactor theory, sedimentation, filtration, precipitation, mass transfer, coagulation/flocculation, disinfection, adsorption and ion exchange. Recommended preparation: CE 442. Cooperative: Open to UI degree-seeking students.
- 542 Biochemical Wastewater Treatment** 3 Principles of biochemical operations used in wastewater treatment including biochemical energetics, kinetics, activated sludge and fixed film reactors, nutrient removal, and sludge handling and treatment. Cooperative: Open to UI degree-seeking students.
- 543 Advanced Topics in Environmental Engineering Practice** V 1-4 May be repeated for credit; cumulative maximum 9 hours. Analysis and evaluation of air/water/soil pollution problems, new measurement methods, hazardous waste treatment, global climate change, and water/wastewater treatments. Cooperative: Open to UI degree-seeking students.
- 550 Hydroclimatology** 3 Water and energy budgets as they relate to climate, dynamics; and remote sensing, statistical, and modeling techniques for hydroclimatology.
- 551 Open Channel Flow** 3 Steady, non-uniform flow; controls and transitions in fixed-bed channels. Credit not granted for both CE 451 and CE 551. Cooperative: Open to UI degree-seeking students.
- 552 Advanced Topics in Hydraulic Engineering** V 1-3 May be repeated for credit; cumulative maximum 9 hours. Cavitation, air entrainment, hydraulic machinery, similitude, mixing in rivers and estuaries, hydraulic design. Required preparation must include CE 351. Cooperative: Open to UI degree-seeking students.
- 555 Natural Treatment Systems** 3 Principles and design procedures of natural systems for wastewater treatment for agricultural and non-agricultural applications. (Crosslisted course offered as CE 555, BSYSE 555). Cooperative: Open to UI degree-seeking students.
- 560 Advanced Hydrology** 3 Components of the hydrologic cycle; conceptual models; watershed characteristics; probability/statistics in data analysis; hydrographs; computer models; and design applications. Credit not granted for both CE 460 and CE 560. Cooperative: Open to UI degree-seeking students.
- 562 Advanced Subsurface Flow and Transport** 3 Analysis of the dynamics of subsurface fluid flow in porous media that give rise to contaminant transport behaviors at multiple scales; emphasis on developing a qualitative knowledge of the features that cause deviations from idealized transport behaviors and the mathematical tools required to model transport in natural, heterogeneous aquifers for both passive and reactive solutes.
- 567 Properties of Highway Pavement Materials** 3 Physical and mechanical properties of asphalt and Portland cement concrete materials; design of asphalt concrete mixes; introduction to viscoelastic theory; characterization methods, emphasizing fatigue, rutting, and thermal cracking; modification and upgrading techniques. Three 1-hr lect a wk and variable number of lab hrs for demonstration. Cooperative: Open to UI degree-seeking students.
- 572 Advanced Pavement Design and Analysis** 3 Design of new and rehabilitated asphalt and Portland Cement concrete pavements; mechanistic-empirical design procedures, performance models; deflection-based structural analysis, overlay design, environmental effect; long-term pavement performance (LTPP), and introduction to research topics in pavement engineering. Required preparation must include CE 473. Cooperative: Open to UI degree-seeking students.
- 580 Graduate Seminar** 1 May be repeated for credit; cumulative maximum 4 hours. Lectures and reports on current developments in research and practice.
- 583 Aquatic Chemistry** 3 Chemical principles as applied to natural environmental system, water supply and pollution and control engineering. (Crosslisted course offered as CE 583, BSYSE 560). Cooperative: Open to UI degree-seeking students.

- 584 Environmental Microbiology 3** Provides a fundamental understanding of microbiology to engineering and environmental science students; cell structure and metabolism; microbial ecology and diversity. Cooperative: Open to UI degree-seeking students.
- 585 Aquatic System Restoration 3** Study of natural, damaged and constructed ecosystems with emphasis on water quality protection and restoration of lakes, rivers, streams and wetlands. (Crosslisted course offered as CE 585, BSYSE 554, ENVR SCI 585). Required preparation must include CHEM 345; MBIOS 101. Required preparation must include CHEM 345; MBIOS 101. Cooperative: Open to UI degree-seeking students.
- 586 Bioremediation of Hazardous Waste 3** Applications of bioremediations in situ subsurface treatment of hazardous waste; subsurface microbial degradation as related to microbial ecology. Cooperative: Open to UI degree-seeking students.
- 588 Atmospheric Turbulence and Air Pollution Modeling 3** Physical aspects of atmospheric turbulence, theoretical developments in atmospheric diffusion, and applied computer modeling with regulatory and research models. Cooperative: Open to UI degree-seeking students.
- 589 Atmospheric Chemical and Physical Processes 3** Processes of removal of pollutants from the atmosphere; radical chain reactions, particle formation, model calculations. Cooperative: Open to UI degree-seeking students.
- 590 Spectroscopy and Radiative Transfer of the Atmosphere 3** Concepts of radiative transfer and molecular spectra in the troposphere and stratosphere with applications to trace gas measurements. Cooperative: Open to UI degree-seeking students.
- 591 Aerosol Dynamics and Chemistry 3** Chemical and physical properties of atmospheric aerosols; sources, sinks, and transformation processes. Cooperative: Open to UI degree-seeking students.
- 593 Polymer Materials and Engineering 3** Preparation and structure-property relationship of polymer materials with emphasis on fracture mechanics and toughening. (Crosslisted course offered as MSE 543, CE 593). Required preparation must include MSE 402. Cooperative: Open to UI degree-seeking students.
- 594 Natural Fibers 3** Structural aspects and properties of natural fibers including anatomy, ultrastructure, and chemistry. (Crosslisted course offered as CE 594, MSE 544). Cooperative: Open to UI degree-seeking students.
- 595 Polymer and Composite Processing 3** Polymer and composite processing from fundamental principles to practical applications. (Crosslisted course offered as MSE 545, CE 595). Cooperative: Open to UI degree-seeking students.
- 596 Engineered Wood Composites 3** Theory and practice of wood composite materials, manufacture and development. (Crosslisted course offered as CE 596, MSE 546). Cooperative: Open to UI degree-seeking students.
- 597 Polymers and Surfaces for Adhesion 3** Physical chemistry of polymers and surfaces needed to understand interface morphology, adhesion mechanisms and bond performance. (Crosslisted course offered as CE 597, MSE 547). Required preparation must include MSE 402 or 404. Cooperative: Open to UI degree-seeking students.
- 598 Natural Fiber Polymer Composites 3** Fundamentals, development and application of composite materials produced from polymers reinforced with natural fibers and wood as major components. (Crosslisted course offered as CE 598, MSE 548). Cooperative: Open to UI degree-seeking students.
- 600 Special Projects or Independent Study V** 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis and/or Examination V** 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 702 Master's Special Problems, Directed Study, and/or Examination V** 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.
- 800 Doctoral Research, Dissertation, and/or Examination V** 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Civil Engineering or Engineering Science PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

CONSTRUCTION ENGINEERING

CON E

- 252 Construction Administration and Documentation 4 (3-2)** Course Prerequisite: CST M 254; MATH 172; certified major in Construction Engineering. Administrative procedures found within a heavy/civil construction project and respective documentation.
- 360 Heavy Construction Estimating I 3 (2-3)** Course Prerequisite: CON E 252; certified major in Construction Engineering. Fundamentals of heavy civil estimating with emphasis on plan reading, specification reading, and quantity takeoff.
- 361 Heavy Construction Estimating II 3 (2-3)** Course Prerequisite: CON E 360; Certified major in Construction Engineering. Basics of scoping, takeoff, costing, pricing, and bidding actual projects "live" alongside real contractors.

The Edward R Murrow College of Communication

communication.wsu.edu
Student Services, Murrow East 226
509-335-7333

Interim Dean, B. Pinkleton; Special Advisor to the Dean, for Research and Graduate Studies, A. S. Tan; Director of Undergraduate Affairs, J. Peterson; General Manager of Murrow Public Media, M. Marcelo; Lester Smith Distinguished Professor, G. Johnson; Professors, E. Austin, E. L. James; Associate Professors, D. Hindman, E. Hindman, S. Hust; Assistant Professors, R. Bailey, P. Borah, A. Boyd, G. Dixon, M. Hutchens, J. Hmielowski, Y. Lee, Y. Nam, J. Willoughby, W. Yan; Clinical Associate Professors, B. Atwood, N. Iyer, R. Kelly, B. Shors, R. Taflinger; Clinical Assistant Professors, R. Cooney, C. Cooney, L. Dubowski, B. Irom, L. Paxson, R. Richardson, R. Risenmay, C. Salazar, D. Scheips, L. Waananen-Jones; Instructors, A. Boggs, C. Curtis, J. Elmer, E. Gallagher, W. McKee, S. Pande, D. Petek, K. Rhoden, P. Wadleigh; Lecturers, G. Bedoyan, J. Prathivi, C. Wilder; Director of Student Services, S. Stout; Director of International Projects, M. Shelley.

Communication is a vital force in society. New practices and techniques in communication require that instruction and research explain these phenomena and prepare students for careers in this exciting area that is being shaped by new communication technologies.

The curricula of The Edward R. Murrow College of Communication lead to the degrees of Bachelor of Arts in Communication, Master of Arts in Communication, Master of Arts in Strategic Communication, and Doctor of Philosophy (Communication).

Students may major in Communication, with an emphasis in Journalism and Media Production (multimedia journalism, broadcast news, broadcast production), Strategic Communication (advertising, public relations, or integrated communication), or Communication and Society (communication technology, science communication, risk and crisis communication). The **Journalism & Media**

Production major focuses on the reporting and editing processes, current mass media issues, and the legal and historical precedents that have shaped the field. In the lab, students are exposed to digital editing technologies designed to help storytellers be more precise in reporting and editing across all media platforms. **Strategic Communication** majors learn to communicate creatively and persuasively to build mutually beneficial long-term relationships between organizations and their publics. The program emphasizes writing, research and management principles through a demanding series of required courses. In addition, students have the opportunity to learn about both advertising and public relations from theoretical and applied viewpoints. Students can put their knowledge to use in preparing media plans, writing advertising strategy and copy, and planning and executing complete campaigns. The **Communication and Society** major is fundamentally about innovation and change – in communication technologies, multi-platform channels, and communication tactics. Students learn to utilize mediated and non-mediated communication channels to purposefully transform their chosen industry, and ultimately position themselves, their networks, and their organizations to innovate and enact change on pressing societal and political issues.

Study in the College’s facilities provides exposure to and mastery of new digital production and content creation technologies. The Edward R. Murrow College of Communication has three computer labs, including a writing lab, an advanced graphics and data analysis lab, and a broadcast news lab; television production studios and TV editing suites; a radio station and radio/audio labs; and a state-of-the-art news production/broadcast lab. In addition, the College houses three nationally acclaimed media outlets, including Northwest Public Radio, Northwest Public Television and the Murrow News Service.

Students graduating from The Edward R. Murrow College of Communication will be able to: 1) effectively and efficiently collect and evaluate information utilizing traditional methods and new technologies; 2) communicate clearly and succinctly, in both written and verbal forms, to varied audiences; 3) carefully observe, interpret and accurately portray events, information, and activities to a diverse society; 4) shape messages to reflect the differing demands and strengths of different and developing media; 5) consider the legal, social, and economic contexts in which media operate and evolve; 6) examine the role and effects of media in contemporary society; 7) understand the ethical and civic responsibilities that accompany a lifelong career in communication in a democratic society; 8) understand the professionalism required to be successful in a highly competitive industry, and 9) compete successfully in regional, national and international job markets.

Undergraduate Minor

The Murrow College of Communication offers an undergraduate minor in Communication. Students may apply to certify in the minor after they have completed 60 credits and are certified in a major outside The Murrow College of Communication. See the requirements for the Minor in Communication below. Check with The Murrow College Student Services Office for additional information.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

COMMUNICATION AND SOCIETY (120 HOURS)

Certification Requirements

To certify a major in Communication, a student must meet the following minimum requirements: (1) Complete COM 101, 105, and 138; (2) Sophomore standing (transfer students should have at least 15 graded credits from courses in residence at WSU); (3) Complete the Murrow College Grammar and Writing exam administered by the College of Communication.

Certification in the Murrow College is based on the following: the number of available seats, the applicant’s cumulative WSU GPA, the number of credits completed at the time of application, and the applicant’s performance on the Murrow College Grammar and Writing Exam. The top students are certified based on the number of seats available that semester. Transfer course grades will NOT be used to calculate the cumulative WSU GPA. Students transferring into the College with 55 or more hours should complete the certification requirements with in two semesters. All students should certify before earning 90 credit hours.

All majors require a minimum of 49 semester hours in Communication.

First Year

<i>First Term</i>	<i>Hours</i>
COM 101 [SSCI]	3
COM 138	1
Diversity [DIVR]	3
ENGLISH 101 [WRTG]	3
Quantitative Reasoning [QUAN]	3
Electives	3

Second Term *Hours*

COM 102 [COMM] or Communication [COMM]	3
COM 105 [HUM]	3
HISTORY 105 [ROOT]	3
Electives	6
Apply for and Certify in Major	

Second Year

First Term *Hours*

Biological Sciences [BSCI] or SCIENCE 101 [SCI] ¹	3 or 4
COM 210	3
COM 300 [M]	3
Electives	6

Second Term *Hours*

COMSOC 301	3
Creative & Professional Arts [ARTS]	3
Physical Sciences [PSCI] or SCIENCE 102 [SCI] ¹	4 or 3
Electives	6
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
COM 309	3

COMSOC 321	3
COMSOC 324 [M]	3
Electives	4

Second Term *Hours*

300-400-level Major Elective ²	6
COMSTRAT 310	3
Major Specialization ³	3
Electives	3

Fourth Year

First Term *Hours*

300-400-level Major Elective ²	3
Integrative Capstone [CAPS]	3
Major Specialization ³	3
Electives	6

Second Term *Hours*

300-400-level Major Electives ²	3
Major Specialization ³	3
Electives	9

¹ For a total of 7 credits—one Biological Science [BSCI] and one Physical Science [PSCI] course, including one lab course, or 8 credits of [SCI] designated courses. (SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI], which is offered Spring semester.)

² Select 12 credits of 300-400-level COM, COMJOUR, COMSOC, COMSTRAT major electives not used to meet other requirements, COMSOC 495 internship credits, or COMSOC 499 Special Projects credits (max. 6 credits of 495/499) in consultation with advisor.

³ Students select a specialization and complete the courses required for the specialty. 1) Communication Technology: COM 420, 482 or 486, and 490. 2) Science Communication: COM 395 or 400, COMSOC 325, and 480. 3) Risk and Crisis Communication: COM 478 or COMSOC 477, COM 486, and COMSOC 326.

JOURNALISM AND MEDIA PRODUCTION (120 HOURS)

Certification Requirements

To certify a major in Communication, a student must meet the following minimum requirements: (1) Complete COM 101, 105, and 138; (2) Sophomore standing (transfer students should have at least 15 graded credits from courses in residence at WSU); (3) Complete the Murrow College Grammar and Writing exam administered by the College of Communication.

Certification in the Murrow College is based on the following: the number of available seats, the applicant’s cumulative WSU GPA, the number of credits completed at the time of application, and the applicant’s performance on the Murrow College Grammar and Writing Exam. The top students are certified based on the number of seats available that semester. Transfer course grades will NOT be used to calculate the cumulative WSU GPA. Students transferring into the College with 55 or more hours should complete the certification requirements with in two semesters. All students should certify before earning 90 credit hours.

All majors require a minimum of 49 semester hours in Communication.

First Year

<i>First Term</i>	<i>Hours</i>
COM 101	3
COM 138	1
Diversity [DIVR]	3
ENGLISH 101 [WRTG]	3
Quantitative Reasoning [QUAN]	3
Social Sciences [SSCI]	3

<i>Second Term</i>	<i>Hours</i>
COM 102 [COMM] or Communication [COMM]	3
COM 105 [HUM]	3
HISTORY 105 [ROOT]	3
Electives	6
Apply for and Certify in Major	

Second Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] or SCIENCE 101 [SCI] ¹	3 or 4
COM 210	3
COM 300 [M]	3
Creative & Professional Arts [ARTS]	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
COMJOUR 350	3
Physical Sciences [PSCI] or SCIENCE 102 [SCI] ¹	4 or 3
Electives	9
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
300-400-level Electives	3
COM 320	3
COMJOUR 333 [M]	3
Electives	6

<i>Second Term</i>	<i>Hours</i>
300-400-level Major Elective ²	3
COM 415	3
Specialization course ³	3
Electives	6

Fourth Year

<i>First Term</i>	<i>Hours</i>
300-400-level Major Elective ²	3
COM 440	3
Integrative Capstone [CAPS]	3
Specialization course ³	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
300-400-level Major Elective ²	6
Specialization course ³	3
Electives	4

¹ For a total of 7 credits—one Biological Science [BSCI] and one Physical Science [PSCI] course, including one lab course, or 8 credits of [SCI] designated courses. (SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI], which is offered Spring semester.)

² Select 12 credits of 300-400-level COM, COMJOUR, COMSOC, COMSTRAT major electives not used to meet other requirements, COMJOUR 495 internship

credits, or COMJOUR 499 Special Projects credits (max. 6 credits of 495/499) in consultation with advisor.

³ Students select a specialization and complete the courses required for the specialty. Broadcast News: COMJOUR 335, 465 [M], and any COM, COMJOUR, COMSOC, or COMSTRAT 475-490. Broadcast Production: COMJOUR 355, 455, and any COM, COMJOUR, COMSOC, or COMSTRAT course numbered 475-490. Multimedia Journalism: COMJOUR 390, 425 [M], and 475 [M].

**STRATEGIC COMMUNICATION
(120 HOURS)****Certification Requirements**

To certify a major in Communication, a student must meet the following minimum requirements: (1) Complete COM 101, 105, and 138; (2) Sophomore standing (transfer students should have at least 15 graded credits from courses in residence at WSU); (3) Complete the Murrow College Grammar and Writing exam administered by the College of Communication.

Certification in the Murrow College is based on the following: the number of available seats, the applicant's cumulative WSU GPA, the number of credits completed at the time of application, and the applicant's performance on the Murrow College Grammar and Writing Exam. The top students are certified based on the number of seats available that semester. Transfer course grades will NOT be used to calculate the cumulative WSU GPA. Students transferring into the College with 55 or more hours should complete the certification requirements with in two semesters. All students should certify before earning 90 credit hours.

Students are required to take at least 3 semester hours of multimedia content creation (COM 210 or equivalent) courses and 3 semester hours of communication writing (COM 300 or equivalent). Transfer students who do not have these credits in their AA can take these credits as electives.

All majors require a minimum of 49 semester hours in Communication.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] or SCIENCE 101 [SCI] ¹	3 or 4
COM 101	3
COM 138	1
Diversity [DIVR]	3
ENGLISH 101 [WRTG]	3
Quantitative Reasoning [QUAN]	3

<i>Second Term</i>	<i>Hours</i>
COM 102 [COMM] or Communication [COMM]	3
COM 105 [HUM]	3
HISTORY 105 [ROOT]	3

Physical Sciences [PSCI] or SCIENCE 102 [SCI] ¹	4 or 3
Electives	3
Apply for and Certify in Major	

Second Year

<i>First Term</i>	<i>Hours</i>
COM 210	3
COM 300 [M]	3

Creative & Professional Arts [ARTS]	3
Social Sciences [SSCI]	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
COMSTRAT 310	3
MKTG 360	3
Specialization Courses ²	6
Electives	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
300-400-level Electives	3
300-400-level Major Elective ³	3
COMSTRAT 309	3
Specialization Courses ²	6

<i>Second Term</i>	<i>Hours</i>
300-400-level Major Elective ³	3
Specialization Course ²	3
Electives	9

Fourth Year

<i>First Term</i>	<i>Hours</i>
300-400-level Major Elective ³	3
Integrative Capstone [CAPS]	3
Specialization Courses and /or Electives ²	6
Electives	3

<i>Second Term</i>	<i>Hours</i>
300-400-level Major Elective ³	3
Specialization Courses and/or Electives ²	8
Electives	2

¹ For a total of 7 credits—one Biological Science [BSCI] and one Physical Science [PSCI] course, including one lab course, or 8 credits of [SCI] designated courses. (SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI], which is offered Spring semester.)

² Students select a specialization and complete the courses required for the specialty. At least one of the specialization courses must be an [M] course. Public Relations Specialization: COMJOUR 333 [M], COMSTRAT 312, 383 [M], 485 [M], and any COM, COMJOUR, COMSOC, or COMSTRAT course numbered 475-490. Advertising Specialization: COMSTRAT 380, 381 [M], 382, 480 [M], and any COM, COMJOUR, COMSOC, or COMSTRAT course numbered 475-490. Integrated Communication Specialization: COMJOUR 333 [M], COMSOC 301, COMSTRAT 309, 310, 312, 380, 383 [M], 476, 485 [M], and 495.

³ Select 12 credits of 300-400-level COM, COMJOUR, COMSOC, COMSTRAT major electives not used to meet other requirements, COMSTRAT 495 internship credits, or COMSTRAT 499 Special Projects credits (max. 6 credits of 495/499) in consultation with advisor.

Minors**Communication**

The minor in Communication requires a minimum of 18 hours, 9 of which must be at the 300-400 level and selected from the following courses: COM 101, 102, 105, 210, 300 [M], 410, 420, 460, 464, 470, 471, 478, 479, 481, 482; COMJOUR 333 [M], 360,

466, 481; COMSOC 230, 301, 321, 421, 476, 477; COMSTRAT 309, 380. Nine hours of upper-division work must be taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. Students may apply to certify in the minor after they have certified in a major outside the Murrow College of Communication. Students must apply to enroll in select courses. Check with the Murrow College Student Services Office for additional information.

Description of Courses

COMMUNICATION

COM

- 100 Grammar and Editing for Communication** 2 Course Prerequisite: By permission only. For Communication majors to ensure sufficient skills in grammar, punctuation, and AP style of writing. S, F grading.
- 101 [SSCI] Media and Society** 3 Mass media's influence in contemporary society.
- 102 [COMM] Public Speaking in the Digital Age** 3 Face-to-face and mediated communication in group and professional settings.
- 105 [HUM] Communication in Global Contexts** 3 Communication processes and how they influence human behavior and construction of social reality across global contexts.
- 138 Communication Overview** 1 May be repeated for credit; cumulative maximum 2 hours. Introduces new students to the major, advising, and strategies for academic and personal success. S, F grading.
- 210 [COMM] Multimedia Content Creation** 3 Applied multimedia content creation and evaluation in graphic design, audio, and video production through communication theory and practice.
- 225 Sports and the Media** 3 Survey of the relationship between media and sports, including sports journalism, sports promotion, sports and Hollywood, sports and social change.
- 300 [M] Writing in Communication** 3 (2-3) Course Prerequisite: Certified major or minor in Communication. Writing for a variety of communication professions, including advertising, broadcasting, print journalism, public relations, and science communication.
- 309 (COMSTRAT) Quantitative Research Methods** 3 Course Prerequisite: Certified major or minor in Communication. Measurement, questionnaire construction, sampling, data collection techniques, analysis and hypothesis testing in communication research.
- 320 Visual Communication** 3 Course Prerequisite: COM 210; COM 300 with a C or better; certified major or minor in Communication. Visual communication in today's print, electronic, and broadcast media to inform, educate, and persuade.
- 395 Science Writing** 3 Course Prerequisite: COM 300; certified major in Communication. Writing about science and technology for print, online, public relations, and broadcast formats.
- 400 [COMM] Communicating Science and Technology** 3 Course Prerequisite: Certified in a major; junior standing. Communicating science and technological issues to professional and lay audiences.
- 410 History of Mass Communications** 3 Course Prerequisite: Certified major or minor in Communication; junior standing.
- 415 Media Law** 3 Course Prerequisite: Certified major or minor in Communication; junior standing. Basic concepts and theories of the First Amendment's protection of speech and press.
- 420 New Communication Technologies** 3 Course Prerequisite: Certified major or minor in Communication; junior standing. New communication technologies, their impact on communication processes, access, regulation, and communication in organization/professional contexts.
- 440 Media Ethics** 3 Course Prerequisite: Certified major or minor in Communication; junior standing. Foundations and frameworks of media ethics; case studies in assessing media performance.
- 460 Mass Media Criticism** 3 Course Prerequisite: Certified major or minor in Communication; junior standing. Theoretical and philosophical basis for critical analysis of mass communication.
- 464 Gender and the Media** 3 Course Prerequisite: COM 101, WOMEN ST 101, or WOMEN ST 201; certified major or minor in communication. How news and entertainment media shape and reinforce societal expectations of gender; consideration of race, age, class, and sexual orientation. (Crosslisted course offered as COM 464, WOMEN ST 464).
- 470 Mass Communications Theories and Theory Construction** 3 Course Prerequisite: Certified major or minor in Communication; senior standing. Theories of mass communication and the process of theory construction.
- 471 [CAPS] Stereotypes in Communication** 3 Course Prerequisite: Certified in any major; junior standing. Examines portrayals of social groups in the media and the impact portrayals have on perceptions, expectations, and aspirations of members of portrayed groups and nonmembers.
- 475 Communication Seminar** 3 May be repeated for credit; cumulative maximum 9 hours. Course Prerequisite: Junior standing. Topics with a broad array of interdisciplinary expertise including elements of communication, public policy, sociology, the humanities, and psychology.
- 478 Health Communication** 3 Course Prerequisite: Certified in any major; junior standing. Mediated communication in disease prevention and health intervention.
- 479 Youth and the Media** 3 Course Prerequisite: Certified in any major; junior standing. Effects of media messages on children and adolescents, and developing responsible and effective programming for youth.
- 481 Mobile Media** 3 Course Prerequisite: COMSTRAT 310 or COM 320; junior standing. Theories, strategies, practices for strategic communication via mobile platforms.
- 482 Computer Mediated Communication** 3 Course Prerequisite: Certified major or minor in Communication; junior standing. Social and psychological implications of computer mediated communication and differences from face-to-face communication.
- 484 Backpack Journalism** 3 May be repeated for credit; cumulative maximum 6 hours. Students travel abroad and report on stories that enhance global awareness and cultural understanding.
- 486 (COMSTRAT 478) Crisis Communication** 3 Course Prerequisite: Certified major in Communication; junior standing. Crisis communication in health, environment, public safety, animal health, and other topics. Case studies and application of principles to in-class practice cases.
- 490 Web Design and Usability** 3 Course Prerequisite: COM 320; COM 420; COMSOC 324 or COMSTRAT 383; COMSTRAT 309; certified major in Communication. Web design with an emphasis on user-centered design and usability.
- 495 Communication Professional Internship** V 2-12 May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: By application only. S, F grading.
- 497 Practicum in Communication** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Certified major or minor in Communication; by permission only. Practicum experience for students in Communication. Faculty directed.
- 499 Special Problems** V 1-4 May be repeated for credit. Course Prerequisite: By interview only. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 500 Communication Colloquium** 1 May be repeated for credit; cumulative maximum 8 hours. Written and oral presentation of research topics in Communication; college colloquium. S, F grading.
- 501 Theory Building in Communication** 3 Relationship of research to theory development; evaluation of current theory and research; planning and executing research within specified theoretical frameworks.
- 502 Consumer Analysis and Brand Development** 3 Consumer analysis and brand development; skills to make strategic communication campaigns successful.

- 504 Instructional Practicum 1** May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: By interview only. S, F grading.
- 506 Persuasion and Social Influence 3** Theories, concepts strategies and processes of persuasion and social influence.
- 507 Communication Ethics Seminar 3** Topics in communication ethics.
- 509 Quantitative Research 3** Introduction to quantitative research in communication; hypothesis development, testing; basic statistics, interpretation; field surveys, laboratory and field experiments, content analysis.
- 514 Health Communication Theories and Campaigns 3** Health communication theories with a focus on campaign construction and evaluation.
- 516 Health Communication and Society 3 3** Reviews, critiques and applications of research regarding the impact of social and cultural environments on health communication.
- 517 Youth and the Media 3** Explores how children, adolescents, and emerging adults use media in decision making and identity formation, health, and civic affairs.
- 521 Foundational Perspectives in Intercultural Communication 3** Overview of three current foundational research perspectives in intercultural communication; functionalist (post-positivist), interpretive and critical.
- 522 Theoretical Perspectives on Intercultural Communication 3** Advanced readings in intercultural communication theory and methods; paradigms in current theorizing.
- 524 Intercultural/International Communication and Social Change 3** Application of communication theory, research and technologies aimed at fostering social change in intercultural and international contexts.
- 526 Current Topics in Intercultural Communication 3** Topics in current intercultural communication research.
- 535 Organizational Communication Theory 3** May be repeated for credit; cumulative maximum 6 hours. Traditional and emerging theories in organizational communication.
- 537 Organization and Society 3** Historical foundations, theoretical developments, contemporary issues and practical implications of communicative processes of organizations within society.
- 540 Risk Communication 3** Research and practice in risk communication.
- 550 Media Processes and Effects: Theory and Practice 3** Physiological, psychological and social effects of media messages and technologies upon individuals and societies.
- 552 Current Issues in Media Processes and Effects 3** Current issues in media processes and effects.
- 561 Multimedia Content Creation 3** Course Prerequisite: Admitted to the online masters program in strategic communication. Exploration and application of strategies to communicate ideas clearly, concisely, and effectively through multimedia content.
- 562 Crisis Communication in Global Contexts 3** Course Prerequisite: Admitted to the online masters program in strategic communication. Prepare, plan, and execute crisis communication and management to protect the continuity of an organization's image and mission.
- 563 Ethics for Professionals 3** Course Prerequisite: Admitted to the online masters program in strategic communication. The understanding, discussion, and application of key theories of individual and institutional ethics; the articulation and defense of ethical reasoning.
- 564 Research Methods for Professionals 3** Course Prerequisite: Admitted to the online masters program in strategic communication. Understanding the role of research in media and related organizations and its application to organizational decision making through quantitative and qualitative research methods including research design, questionnaire construction, sampling, data collection techniques, and variable measurement.
- 570 Communication Theory 3** Relevant theories and research from mass and interpersonal communication.
- 571 Theoretical Perspectives on Media and Society 3** Theories explaining the social and cultural environments of communication processes emphasizing in mass communication.
- 572 Mass Media, Social Control, and Social Change 3** Study of the forces that influence the media's role as an agent of social control or social change.
- 573 Media and Public Discourse 3** Historical and contemporary concepts, questions and dynamics constituting the role of media and discourse among various publics.
- 580 Topics in Communication 3** May be repeated for credit; cumulative maximum 12 hours. Contemporary, specialized, or technical topics in communication.
- 591 Qualitative Research Methods 3** Historical, textual, and legal methodologies for theory-based evaluative and discourse studies in communication.
- 599 Seminar in Communication 3** May be repeated for credit; cumulative maximum 6 hours. Special topics in rhetoric, communication, and public address.
- 600 Special Projects or Independent Study V 1-18** May be repeated for credit. Course Prerequisite: By interview only. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination V 1-18** May be repeated for credit. Course Prerequisite: By interview only. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 702 Master's Special Problems, Directed Study, and/or Examination V 1-18** May be repeated for credit. Course Prerequisite: By interview only. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.
- 800 Doctoral Research, Dissertation, and/or Examination V 1-18** May be repeated for credit. Course Prerequisite: Admitted to the Communication PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

JOURNALISM AND MEDIA PRODUCTION

COMJOUR

- 150 Introduction to Broadcast Equipment 1** Orientation to broadcast equipment; audio, studio television, and field television, as applied to various functions. S, F grading.
- 333 [M] Reporting Across Platforms 3** Course Prerequisite: COM 210; COM 300 with a C or better; certified major or minor in Communication. Instruction in reporting, writing and editing news stories suitable for publication and on-air presentation.
- 335 Broadcast News Reporting 3 (2-3)** Course Prerequisite: COMJOUR 333; certified major in communication. Fundamentals of broadcast reporting; development of editorial and news judgment, writing skills, and proficiency in field camera production and editing.
- 350 News and Society 3 (2-3)** Course Prerequisite: Certified major in Communication. Fundamentals of historic, contemporary, and emerging models of news production; social contexts and effects, alternative sources, and critiques of news.
- 355 Beginning Television Production 3 (1-6)** Course Prerequisite: COMJOUR 333; certified major in Communication. Beginning television studio production, directing, lighting, graphic design, editing, video/audio compression.
- 360 Writing for Television 3 (2-3)** Course Prerequisite: Certified major in Communication. Theory and practice of writing scripts: analysis of dramatic, comedic, commercial, documentary scripts; writing scripts for each genre.

- 390 Video for the Web 3** (2-3) Course Prerequisite: COM 210; certified major in communication. Capture, design, edit, and compress quality video and audio; basic lighting techniques.
- 425 [M] Reporting of Public Affairs 3** Course Prerequisite: COMJOUR 333 or JOUR 305; certified major in Communication. Research covering public and private sectors.
- 433 Advanced Radio News and Production 3** (2-3) Course Prerequisite: COMJOUR 333 or JOUR 305; certified major in Communication. Intense radio news and production course designed to refine radio news writing, reporting, and on-air presentation skills.
- 455 Advanced Television Production 4** (3-3) May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: COMJOUR 355; certified major in Communication. Field production; editing; advanced studio production.
- 465 [M] Advanced Television News 4** (3-3) May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: COMJOUR 335; certified major in Communication. Writing, reporting, and editing broadcast news; development and production of broadcast quality news.
- 466 Digital Video Editing for News Reporting and Documentary 3** (2-3) Course Prerequisite: Certified major or minor in Communication. Video editing for news reporting; feature-length editing for news and public affairs topics; documentaries; visual storytelling.
- 481 Broadcast Management 3** Course Prerequisite: Certified major or minor in Communication; senior standing.
- 486 (475) Murrow News Service 3** May be repeated for credit; cumulative maximum 9 hours. Course Prerequisite: COMJOUR 335, 355, or 425; certified major in Communication. Advanced journalism and media production to produce investigative, watchdog news reports for media outlets and public.
- 495 Broadcasting Professional Internship V** 2-12 May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: COMJOUR 333 and COMJOUR 350; COMJOUR 355 or 425; certified major in communication; by interview only. S, F grading.
- 499 Special Problems V** 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.

COMMUNICATION AND SOCIETY

COMSOC

- 230 Principles of Group Communication 3** Theoretical and practical aspects of communication in groups; classroom exercises and films demonstrate principles and develop skills.

- 301 Foundations of Persuasion 3** Course Prerequisite: Certified major or minor in Communication. Theories of persuasion and social action; study of strategies and techniques for the persuasive use of language and other symbols.
- 321 [DIVR] Intercultural Communication 3** Course Prerequisite: Certified in any major. Culture and cultural differences, race and ethnicity, stereotypes, and intercultural communication in contexts.
- 324 [M] Reasoning and Writing 3** Course Prerequisite: COM 210; COM 300 with a C or better; certified major in Communication. Theories of persuasion and social action; study of strategies and techniques for the persuasive use of language and other symbols.
- 325 (476) Environmental Communication 3** Course Prerequisite: Certified major or minor in Communication; junior standing. How communication shapes human understanding and decision making concerning the natural environment in local, national, and global contexts.
- 326 (478) Organizing for Social Change 3** Course Prerequisite: Certified in any major; junior standing. Models of social change campaigns, social movements, and organizing grassroots organizations.
- 421 [CAPS] Intercultural Communication and Globalization 3** Course Prerequisite: Junior standing. How global processes shape intercultural communication and how globalization is understood, advanced, and opposed by different groups.
- 477 Risk Communication 3** Course Prerequisite: Certified in any major; junior standing. Research on perceptions of risk among stakeholders about complex environmental and natural resource issues.
- 480 Science Communication Campaigns 3** Course Prerequisite: COMSOC 324 or COMSTRAT 383; COMSTRAT 309; COMSTRAT 310; certified major in Communication. Develop an effective communication campaign to address a science communication challenge.
- 495 Communication and Society Professional Internship V** 2-12 May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: By application only. S, F grading.
- 499 Special Problems V** 1-4 May be repeated for credit. Course Prerequisite: certified major in communication; by interview only. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.

STRATEGIC COMMUNICATION

COMSTRAT

- 310 Digital Content Promotion 3** Course Prerequisite: COM 210; COM 300 with a C or better; certified major in communication. Practice and promotion of public relations and advertising through digital and social media.
- 312 Principles of Public Relations 3** Course Prerequisite: COM 300 with a C or better; certified major in communication. Principles, theories, methods and objectives of public relations; public relations problems and practices.
- 380 Advertising Principles and Practices 3** Advertising history, theory and practice by advertising agencies and organizations.
- 381 [M] Creative Media Strategies and Techniques for Advertising 3** Course Prerequisite: COM 210; COM 300 with a C or better; certified major in Communication. Development of creative content for persuasive campaigns through different media.
- 382 Media Planning 3** Course Prerequisite: COMSTRAT 380; certified major in Communication. Media planning theories, strategies, and practices.
- 383 [M] Media Strategies and Techniques for Public Relations 3** Course Prerequisite: COM 210; COM 295 or 300, with C or better; certified major in Communications. Development of creative content for persuasive public relations campaigns through different media.
- 475 Strategic Communication Seminar in Public Relations 3** May be repeated for credit; cumulative maximum 9 hours. Course Prerequisite: Certified major in Communication; junior standing. Theory, methods, and applications of communication and campaign management; political communication, health communication, freedom of expression, special audiences.
- 476 Consumer Insights and Branding 3** May be repeated for credit; cumulative maximum 9 hours. Course Prerequisite: Certified major in Communication; junior standing. Advertising account planning based on a thorough understanding of target audiences and consumer research; linking client objectives, account management, creative and media planning.
- 477 Message Design for Communication Campaigns 3** Course Prerequisite: Certified major in Communication; junior standing. Theory-based design, market testing, and evaluation of messages for health and positive social outcomes.
- 480 [M] Advertising Agency Operation and Campaigns 3** Course Prerequisite: COMSTRAT 380; COMSTRAT 381; COMSTRAT 382; certified major in Communication. Principles and functions of advertising management: campaign planning, execution, presentation and evaluation.

485 [M] Public Relations Management and Campaigns 3 Course Prerequisite: COMSTRAT 309 or 409; COMSTRAT 312; COMSTRAT 381 or COMSTRAT 383; certified major in Communication. Application of public relations principles, management, persuasion theory and research methods to public relations issues.

495 Strategic Communication Professional Internship V 2-12 May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: One series COMJOUR 333 and COMSTRAT 312, OR COMSTRAT 380 and COMSTRAT 381 or 382; certified major in Communications; by interview only. S, F grading.

499 Special Problems V 1-4 May be repeated for credit. Course Prerequisite: certified major in communication; by interview only. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.

561 Persuasion for Professional Communicators 3 Course Prerequisite: Admitted to the online masters program in strategic communication. Introduction to theories, concepts, strategies, and processes of persuasion and social influence.

562 Creative Media Strategies and Techniques 3 Course Prerequisite: Admitted to the online masters program in strategic communication. The strategies, processes, procedures and steps involved in creating marketing communications materials for a variety of different media.

563 Professional Digital Content Promotion 3 Course Prerequisite: Admitted to the online masters program in strategic communication. The application of writing, critical thinking, and persuasion skills to the practice and promotion of PR and advertising in both digital and social media outlets.

564 Consumer Behavior and Brand Development 3 Course Prerequisite: Admitted to the online masters program in strategic communication. Tactics and strategies for consumer analysis and brand development; skills necessary for uncovering consumer insights to link client objectives, account management, creative development, and media planning.

565 Professional Marketing Communication Management and Campaigns 3 Course Prerequisite: Admitted to the online masters program in strategic communication. An overview of behavior change theories with a focus on strategic marketing campaign design and evaluation; learning to use theory and research to more effectively plan, design, execute and evaluate strategic communication campaigns.

701 Master's Independent Capstone Project and /or Examination V 1-6 May be repeated for credit. Capstone project or final examination for professional master's degree under the Graduate School. The credits will include a balloted evaluation of the student's completion of the program's capstone/examination requirements by the program's graduate faculty. Students must have graduate degree-seeking status and obtain approval from their major advisor/committee chair before enrolling for 701 credit. S, U grading.

702 Master's Special Problems, Directed Study, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the online masters program in strategic communication. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

Program in Creative Media and Digital Culture - Vancouver

cas.vancouver.wsu.edu/creative-media-digital-culture
Science & Engineering Building (VSCI), Room 130
360-546-9620

Academic Director, Amy Wharton, Ph.D.; Program Director and Professor: Dene Grigar, Ph.D.; Academic Coordinator: Ted Fordyce; Faculty: John Barber, Ph.D.; Brenda Grell, M.F.A.; Will Luers, M.F.A.; Michael Rabby, Ph.D.

The Creative Media and Digital Culture (CMDC) is an academic program, unique to Washington State University Vancouver, that houses the B.A. in Digital Technology and Culture. Anchored within the field of digital media with emphasis on the intersection of art, technology and the humanities, the Program features a strong interdisciplinary and transdisciplinary focus across the College of Arts and Sciences, as well as the Colleges of Business, Communication, Science, and Engineering and Computer Science and emphasizes critical thinking, creativity, and technological expertise. The goal of the Program is to offer a broad-based degree that prepares students for the media-rich, technologically complex 21st Century.

The DTC degree of the CMDC offers two programs of study: 1) Media Authoring and 2) Knowledge of Management and Production. In addition to course work in DTC, students also take classes in Anthropology, Communication, Computer Science, English, Fine Arts, History, Management Information Systems, Political Science, Psychology, and Sociology. Directed studies and internships encourage students to gain real world experience and engage in projects aimed at serving the community, both of which help students with

professional career networking and developing a commitment to public service.

Along the way, the DTC program provides an intellectual environment comprised of special events like lectures, residency programs, performances by internationally known artists, and field trips to media arts shows and exhibits, and it offers its students state-of-the-art computer labs and studios in which to work and learn. Class sizes are kept small to assure one-on-one contact with faculty.

Option in Digital Technology and Culture

Students may also select Digital Technology and Culture as a primary or secondary concentration within the Bachelor of Arts in Humanities or the Bachelor of Arts in Social Sciences.

The Primary Concentration option requires the completion of at least 24 semester hours of approved DTC course work, including at least 15 upper-division semester credits.

The Secondary Concentration option requires the completion of at least 15 semester hours of approved DTC course work, including at least six upper-division semester credits.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

DIGITAL TECHNOLOGY AND CULTURE - CREATIVE MEDIA AND DIGITAL CULTURE OPTION (VANCOUVER ONLY) (120 HOURS)

First Year

First Term	Hours
Communication [COMM] or Written Communication [WRTG]	3
HISTORY 105 [ROOT]	3
Humanities [HUM]	3
Quantitative Reasoning [QUAN]	3
Foreign Language, if necessary, or Elective	3 or 4

Second Term	Hours
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3
FINE ART 102 ¹	3
Foreign Language, if necessary, and/or Elective	7

Second Year

First Term	Hours
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ²	4
Diversity [DIVR]	3
Social Sciences [SSCI]	3
Electives	5

Second Term	Hours
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ²	4
Electives	7
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
DTC 355 [M]	3
DTC 356	3
DTC Concentration ³	3
MIS 250	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
DTC 375 [M]	3
FINE ART 332 or 333 (recommended)	3
DTC Concentration ³	3
DTC Core Option ⁴	6

Fourth Year

<i>First Term</i>	<i>Hours</i>
Integrated Capstone [CAPS]	3
DTC Concentration ³	6
DTC Core Option ⁴	3
300-400-level Electives	3

<i>Second Term</i>	<i>Hours</i>
DTC 475	3
DTC 497	3
Electives	9

¹ Prerequisite to FINE ART 332 and 333.

² To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

³ 12 hours must be earned in one of two DTC Concentration areas: 1) Media Authoring: Approved courses include DTC 335, 336, 338, 354, 435, 476, 477, 478, FINE ART 331, 363, 385, 433, 434, 435, 452, or MUS 364; 2) Knowledge Management and Production: Approved courses include CS 443, DTC 338, 476, HISTORY 438, MIS 322 [M], or 374.

⁴ DTC Core Options (3 courses): ANTH 301, 330, 350, CS 402 [M], ENGLISH 339, 342, 361, 402 [M], FINE ART 331, 332, 333, FOR LANG 350, 410, HISTORY 381, 382, 400, 483, POL S 317, PSYCH 384, SOC 372, 373, 430, or WOMEN ST 340.

Minors**Digital Technology and Culture
-- Vancouver**

A minor in DTC requires 18 hours including DTC 101, 201, DTC/ENGLISH 336, 355, and 375, plus one more 3-hour course from the following: DTC 335, 356, 435, 477, 478, FINE ART 331, 332, 333, 363, 434, or 435. 9 hours of upper-division work must be taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Description of Courses**DIGITAL TECHNOLOGY AND CULTURE****DTC**

101 [ARTS] Introduction to Digital Technology & Culture 3 Inquiry into digital media, including origins, theories, forms, applications, and impact with a focus on authoring and critiquing multimodal texts.

201 [ARTS] Tools and Methods for Digital Technology 3 An introduction to the tools and methods of production for multimedia authoring in digital contexts.

335 Digital Animation: Story, Narration and Production 3 (2-2) 3-D digital animation for creative and professional presentations using Maya software, art skills, story-telling and team problem-solving techniques.

336 Composition and Design 3 Course Prerequisite: DTC 201. Design practices and process for composing for a multimedia environment including color, pattern and shape. (Crosslisted course offered as DTC 336, ENGLISH 336).

338 Special Topics in Digital Technology and Culture 3 May be repeated for credit; cumulative maximum 6 hours. Major trends or artists in digital technology and culture.

354 Digital Storytelling 3 Nonlinear, multi-linear, and interactive narrative using elements of creative writing such as character, dialog, setting, plot and image. (Crosslisted course offered as DTC 354, ENGLISH 354).

355 [M] Multimedia Authoring: Exploring New Rhetorics 3 Writing for new computer-based media; multimedia authoring project; examination of new rhetorics of information technology. (Crosslisted course offered as DTC 355, ENGLISH 355).

356 Information Structures 3 Course Prerequisite: DTC 101. Social and cultural role of information; research with electronic sources; production, validation, storage, retrieval, evaluation, use, impact of electronic information. (Crosslisted course offered as DTC 356, ENGLISH 356).

375 [M] Language, Texts and Technology 3 Course Prerequisite: DTC 101. Relationship between technology and communication; writing practices from a historical point of view. (Crosslisted course offered as DTC 375, ENGLISH 375).

435 Advanced Animation 3 (2-2) Course Prerequisite: DTC 335. Advanced investigation of tools and methods for 2D and 3D digital animation. (Crosslisted course offered as DTC 435, ENGLISH 435).

475 Digital Diversity 3 Course Prerequisite: Junior standing. Cultural impact of electronic media, especially the World-Wide Web; issues of race, class, gender, sexuality online. (Crosslisted course offered as AMER ST 475, DTC 475, ENGLISH 475).

476 Digital Literacies 3 Course Prerequisite: DTC 375. Development and use of new literacies as they affect communication through technology. (Crosslisted course offered as DTC 476, ENGLISH 476).

477 Advanced Multimedia Authoring 3 Course Prerequisite: DTC or ENGLISH 355. Advanced writing, imaging and teamwork skills for authoring in new computer-based media; website project in client-oriented context. (Crosslisted course offered as DTC 477, ENGLISH 477).

478 Usability and Interface Design 3 (0-6) Course Prerequisite: DTC or ENGLISH 355. Design of websites using best practices of visual literacy, interface architecture and usability. (Crosslisted course offered as DTC 478, ENGLISH 478).

497 Senior Seminar 3 Course Prerequisite: Completion of Junior Writing Portfolio; certified major in Digital Technology and Culture; senior standing. Major multimedia project for nonprofit organization or small business with special focus on project management, planning, and execution.

498 Internship V 2-9 May be repeated for credit; cumulative maximum 9 hours. Direct professional learning experiences in the area of digital media, technology, and culture. S, F grading.

499 Special Problems V 1-4 May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: Certified major in Digital Technology and Culture; junior standing. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.

560 Critical Theories, Methods, and Practice in Digital Humanities 3 History, theory, and practice of digital humanities, with attention paid to how digital humanities are transforming disciplinary knowledge. (Crosslisted course offered as ENGLISH 560, DTC 560).

561 Studies in Technology and Culture 3 Foundation examination of key concepts, tools, and possibilities afforded by engaging with technology through a critical cultural lens. (Crosslisted course offered as DTC 561, ENGLISH 561).

Department of Criminal Justice and Criminology

crmj.wsu.edu
Johnson Tower, 701
509-335-8611

Professor and Chair, C. Hemmens; Professors, D. Brody, F. Lutze, O. Marenin, M. Stohr, B. Vila; Associate Professors, L. Drapela, Z. Hamilton, M. Neuilly, D. Wood; Assistant Professors, D. Makin, A. Pedneault, D. Willits.

The Department of Criminal Justice and Criminology offers substantive studies in criminal justice and criminology in conjunction with a liberal arts education. It prepares students for a broad range of careers in criminal justice institutions, government agencies at local, state, and federal levels, private support and welfare organizations, private security work, and domestic and international corporations, as well as for the pursuit of graduate study or law school; develops leadership qualities; and promotes the ideal of professional achievement in public service.

Criminal Justice and Criminology is the interdisciplinary study of the problem of crime and of the institutions, policies and practices by which society responds to the problem of crime, as well as theories of human behavior and normative philosophies directly related to the maintenance of social order, the control of crime and the achievement of a just society. Specific courses in the program focus on social control issues and policies, substantive and procedural criminal law, the organization and workings of criminal justice institutions (police, courts, corrections, juvenile justice), issues relevant to groups in American society (gender, minorities), research and evaluation skills, theories of crime and delinquency, ethics, and the evaluation of management, programs, and policies conducted by justice system institutions.

Students are also required to complete related courses on the larger political, legal, economic and social environments in which crime and the criminal justice system operate. Taught by a multi-disciplinary faculty, courses cover such areas as public administration, American public policy, constitutional law, and gender and politics. Additional elective courses are offered by departments within the College of Arts and Sciences.

We expect that graduating students will have an understanding of: 1) the causes of crime, 2) the components, processes, and programs of the criminal justice system, 3) the interconnectedness of theory, research, and practice, 4) the complexities of achieving justice in a multi-cultural society, 5) the intricacies of policy formation and implementation, and 6) the ability to understand and interpret social science research.

The course of study leads to the Bachelor of Arts in Criminal Justice and Criminology, and the Masters Degree and Ph.D. Degree in Criminal Justice and Criminology.

Transfer Students

Students planning to transfer to Washington State University at the end of the freshman or sophomore year should follow as closely as possible the general and core course requirements set forth in the schedule of studies. If this is done, there should be no difficulty in completing the requirements for the bachelor's degree within the normal period of four years.

Preparation for Graduate Study

Undergraduates who are pursuing their studies at other institutions or through other curricula at this institution and who contemplate graduate work in this program will do well to elect courses similar to those required in the schedule of studies.

Student Learning Outcomes

The B.A. in Criminal Justice and Criminology is designed to empower students as critical thinkers, creative evaluators, ethical actors, and effective

communicators concerning matters of crime and administration of justice at the local, state, national, and international levels.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

CRIMINAL JUSTICE AND CRIMINOLOGY (120 HOURS)

A student may certify as a criminal justice and criminology major upon completing 24 semester hours and a minimum WSU cumulative GPA of 2.50 or better.

Students who major in criminal justice and criminology must complete the 15 hour criminal justice core (CRM J 101, 201, 330, 450, and either 320 or 420); 6 hours in research methods and quantitative analysis; 6 hours in criminal justice institutions courses; 9 hours in criminal justice electives; 9 hours from any upper-division political science courses; and 3 hours in specified College of Arts and Sciences electives.

First Year

<i>First Term</i>	<i>Hours</i>
CRM J 101	3
ENGLISH 101 [WRTG]	3
Quantitative Reasoning [QUAN]	3 or 4
Social Sciences [SSCI]	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
Creative & Professional Arts [ARTS]	3
CRM J 201	3
HISTORY 105 [ROOT]	3
Electives	4

Second Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
CRM J 330	3
Diversity [DIVR]	3
Humanities [HUM]	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
CRM J Electives ²	3
CRM J Institution Course ³	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4
300-400-level POL S Course ⁴	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
CRM J 311	3
CRM J 320 or 420 [M]	3
CRM J Electives ²	3
CRM J Institution Course ³	3
300-400-level POL S Course ⁴	3

<i>Second Term</i>	<i>Hours</i>
CRM J 321	3
CRM J Electives ²	3
300-400-level POL S Course ⁴	3
Electives	6

Fourth Year

<i>First Term</i>	<i>Hours</i>
CRM J 403 [CAPS] or Integrated Capstone [CAPS]	3
Foreign Language, if necessary, and/or Electives	7
Non CRM J Departmental Elective ⁵	3

<i>Second Term</i>	<i>Hours</i>
CRM J 450 [M]	3
Foreign Language, if necessary, or Electives	4
Electives	7

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² Any CRM J course not used to fulfill other CRM J requirements. CRM J and general electives must include coursework to meet University requirement of 2 [M] courses and 40 Upper Division credits.

³ CRM J Institution courses are (6 credits): CRM J 365, 370, 380, and 385.

⁴ Choose from any 300- or 400-level POL S course.

⁵ Non CRM J Departmental Electives are (3 credits): PSYCH 324, 350, SOC 300 [M], 360, 362, and 384.

Minors

Criminal Justice and Criminology

The minor in Criminal Justice and Criminology requires 18 credits of course work in criminal justice, including CRM J 101, 201, 205, and 330. Half of the courses must be taken at the 300-400 level and taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. Students should contact the Criminal Justice Program for details.

Description of Courses

CRIMINAL JUSTICE

CRM J

101 [SSCI] Introduction to the Administration of Criminal Justice 3
Agencies and processes in the administration of criminal justice. Cooperative: Open to UI degree-seeking students.

201 Introduction to Criminological Theory 3
Analysis of conceptions of crime and seriousness as determined by societal factors.

205 [DIVR] Realizing Justice in a Multicultural Society 3
The pursuit of justice and the historical, contemporary, and future issues and challenges facing society and the criminal justice system.

- 311 Research Methods for Criminal Justice** 3 Course Prerequisite: CRM J 101. Discussion of research methods appropriate for the study of crime and criminal justice policies and institutions.
- 320 Criminal Law** 3 Course Prerequisite: CRM J 101. Substantive criminal law; principles, functions, and limits; basic crime categories, state and national legal research materials. Cooperative: Open to UI degree-seeking students.
- 321 Quantitative Methods for Criminal Justice** 3 Course Prerequisite: CRM J 101. Critical discussion of skills and methods needed for the analysis of implementation and impact of criminal justice policies.
- 330 Crime Control Policies** 3 Course Prerequisite: CRM J 101. Analysis of ideologies, assumptions, and performance of crime control policies. Cooperative: Open to UI degree-seeking students.
- 365 Juvenile Justice and Corrections** 3 Course Prerequisite: CRM J 101. History, philosophy, legal process, performance, and outcomes of the juvenile justice and corrections systems. (Crosslisted course offered as CRM J 365, SOC 367). Cooperative: Open to UI degree-seeking students.
- 370 Introduction to Policing in America** 3 Course Prerequisite: CRM J 101. Development, organization, policies, and performance of the police. Cooperative: Open to UI degree-seeking students.
- 380 Criminal Courts in America** 3 Course Prerequisite: CRM J 101. Structure and process of the prosecution and adjudication of individuals charged with crimes in the criminal court system.
- 381 Crime and Justice in the Movies** 3 (2-2) Course Prerequisite: CRM J 101. Mass media as both reflector and shaper of public attitudes and opinions about crime, criminals, law, order, and justice; using films. (Crosslisted course offered as CRM J 381, POL S 381).
- 385 Institutional Corrections** 3 Course Prerequisite: CRM J 101. Ideologies of punishment and correction, intermediary sanctioning and reintegration policies in the criminal justice system.
- 400 [M] Issues in the Administration of Criminal Justice** 3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: CRM J 101. Selected topics in criminal justice. Cooperative: Open to UI degree-seeking students.
- 403 [CAPS] Violence Toward Women** 3 Course Prerequisite: Junior standing. Violence toward women and its relationship to broader social issues such as sexism and social control. (Crosslisted course offered as CRM J 403, WOMEN ST 403).
- 405 [M] Comparative Criminal Justice Systems** 3 Course Prerequisite: CRM J 101. Comparative study of criminal justice systems in the US and selected foreign countries. (Crosslisted course offered as CRM J 405, POL S 405). Cooperative: Open to UI degree-seeking students.
- 420 [M] Criminal Procedure** 3 Course Prerequisite: CRM J 101. Principal court decisions concerning standards of conduct and rights in the criminal process. Cooperative: Open to UI degree-seeking students.
- 424 Community Corrections** 3 Course Prerequisite: CRM J 101. Theory practice and human impact of treating criminal offenders in the community. Cooperative: Open to UI degree-seeking students.
- 426 Victimology and Public Policy** 3 Examination of victimization; policy responses to victims; victim's rights.
- 427 Crime Prevention Strategies** 3 Personal, environmental, community-based and government crime prevention strategies and issues.
- 428 Drug and Alcohol Use and Abuse** 3 Course Prerequisite: CRM J 101. Drug use, impact on behavior and drug control policies.
- 450 [M] Senior Seminar: Ethical Issues in Criminal Justice** 3 Course Prerequisite: CRM J 101; senior standing. Examination of ethical issues in decision making in criminal justice.
- 468 Addictive Behavior Across the Demographic Spectrum** 3 Course Prerequisite: Junior standing. Overview of social, cultural and historical perspectives on dealing with addictive behavior. (Crosslisted course offered as SOC 468, CRM J 468, PSYCH 468). Recommended preparation: SOC 101, PSYCH 105, or CRM J 101.
- 490 Criminal Justice Internship** V 2-12 May be repeated for credit; cumulative maximum 12 hours. On/off-campus internship in criminal justice institutions (police, FBI, jails, law firms, etc.); written assignments and readings will be required. S, F grading.
- 491 Special Topics: Study Abroad** 3 May be repeated for credit; cumulative maximum 12 hours. Criminal Justice Study Abroad. Cooperative: Open to UI degree-seeking students.
- 499 Special Problems** V 1-4 May be repeated for credit. Course Prerequisite: CRM J 101. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 505 Comparative Criminal Justice** 3 Comparative study of crime laws and criminal justice systems in selected foreign countries. Cooperative: Open to UI degree-seeking students.
- 510 Leadership in Criminal Justice** 3 Study of leadership models and theories as they apply to criminal justice institutions.
- 511 Criminal Justice Management** 3 Examines the theoretical framework for understanding criminal justice organizations through examining management theory, organizational dynamics, and administration research.
- 512 Juvenile Justice** 3 Examination of the major theories and contemporary issues related to juvenile delinquency, the juvenile justice system, gangs, and juvenile corrections.
- 513 Multicultural Issues in Criminal Justice** 3 Critical examination of race, gender, and other diversity and cultural issues within the U.S. criminal justice system.
- 514 Professional Development in Criminal Justice and Criminology** 1 Professional aspects of research, teaching, and service activities in criminal justice and criminology. S, F grading.
- 520 Criminal Justice Research Methods** 3 The design and execution of criminal justice research; critical examination of current research methods in criminal justice.
- 521 Advanced Topics in Criminal Justice Research Methods** 3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: CRM J 520. Exploration of specialized topics in research methodology; topics may include qualitative methods, GIS, ethnography, and survey design.
- 522 Foundations of Quantitative Methods** 3 Application of foundational quantitative methods utilized in the field of Criminal Justice and Criminology.
- 523 Intermediate Quantitative Methods** 3 Course Prerequisite: CRM J 522. Intermediate-level quantitative methods including logistic regression, factor analysis, propensity scoring and model building.
- 524 Advanced Topics in Quantitative Methods** 3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: CRM J 523. Advanced quantitative methods used in criminal justice, including time series, HLM, multi-level modeling, spatial analysis, and repeated measures analysis.
- 530 Criminal Justice: Process and Institutions** 3 Processes of criminal justice in the context of the social, political, and economic environments. Cooperative: Open to UI degree-seeking students.
- 531 Drugs, Alcohol, and Crime** 3 Examination of the research and theory surrounding the relationship between alcohol, drugs, crime, and the criminal justice system.
- 540 Seminar in Evaluation Research** 3 Interrelationship of ideology, data, policy development, and policy implementation in public policy analysis. (Crosslisted course offered as CRM J 540, POL S 541). Cooperative: Open to UI degree-seeking students.
- 541 Seminar in Corrections** 3 Current issues related to the control, management, and sanctioning of criminal offenders. Cooperative: Open to UI degree-seeking students.
- 542 Community Corrections** 3 Examines correctional processes in a community setting, including probation, parole, and innovative community-based strategies for dealing with the offender.
- 555 Seminar in Criminological Theory** 3 Individual, situational and ecological correlates of criminal behavior; data sources and empirical research.

- 560 Prosecution and Adjudication 3** The function of courts and the behavior of prosecutors, defense attorneys and judges within the criminal justice system.
- 570 The Police and Society 3** Community and selected social institutional factors as related to their influence on police systems. Cooperative: Open to UI degree-seeking students.
- 572 Seminar in Comparative Policing 3** Study of the history, organization, and policies of policing systems in selected countries and of transnational policing. Cooperative: Open to UI degree-seeking students.
- 580 Gender and Justice 3** Criminal justice system's treatment of women offenders, victims, and professionals.
- 591 Seminar in the Administration of Criminal Justice 3** May be repeated for credit; cumulative maximum 6 hours. Current issues, problems, and critical concerns within the field of administration of criminal justice. Cooperative: Open to UI degree-seeking students.
- 592 Proseminar in Administration, Justice, and Applied Policy Studies 3** May be repeated for credit; cumulative maximum 6 hours. Same as POL S 542.
- 594 Special Topics in Comparative Criminology and Criminal Justice 3** May be repeated for credit; cumulative maximum 6 hours. Intensive study of specific topics in comparative criminal justice or criminology.
- 595 Advanced Topics in Criminal Justice Institutions and Processes 3** May be repeated for credit; cumulative maximum 6 hours. In-depth study of issues associated with criminal justice institutions and processes.
- 596 Special Topics: Criminal Justice and Public Health 3** May be repeated for credit; cumulative maximum 6 hours. Examination of public health ramifications of criminal justice policy and practice; public health approaches to violence and substance abuse prevention.
- 600 Special Projects or Independent Study V 1-18** May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination V 1-18** May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 702 Master's Special Problems, Directed Study, and/or Examination V 1-18** May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Criminal Justice and Criminology PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Department of Critical Culture, Gender, and Race Studies

libarts.wsu.edu/ccgrs/
Wilson-Short Hall 111
509-335-2605

Chair and Professor, D. Leonard; Professors, M. Bloodsworth-Lugo, C.R. King; Associate Professors, L.Gordillo, L. Guerrero, L. Heidenreich, C. Lugo-Lugo, R. Ong, N.Shahani, J. Streamas, P. Thoma; Assistant Professor, J. Barclay; Clinical Associate Professor, M. Sciachitano.

The Department of Critical Culture, Gender, and Race Studies (CCGRS) brings together leading scholars, committed to teaching and research, who have created an intellectual community at the forefront of critical cultural studies in the Pacific Northwest. The Department offers majors and minors in Comparative Ethnic Studies and Women's Studies as well as Master of Arts and Doctor of Philosophy degrees in American Studies. CCGRS provides interdisciplinary analyses of race, gender, and culture, encouraging students to understand systems of inequality in local, national, and global contexts. The Department equips students for lifelong learning and critical engagement, preparing them for careers in a range of occupations, including business, social service, law, education, research, and public policy.

CCGRS Mission

The Department of Critical Culture, Gender, and Race Studies (CCGRS) is a dynamic community of scholars and students committed to the interdisciplinary and intersectional analyses of social identities, political ideologies, and institutional arrangements. CCGRS emerges out of social movements and intellectual currents that interrogate and unsettle political and ideological models. It also brings marginalized perspectives and experiences into dialogue with dominant narratives. With an emphasis on student-centered, active learning, the curriculum nurtures rounded understandings of power structures, historical conditions, and social locations, underscoring the interconnections of race, class, gender, sexuality, and cultural practices. Conducting research at the leading edges of their fields, the faculty of CCGRS advance transformative knowledge through collaborative, creative, and critical inquiry.

CCGRS Vision

Through teaching, research, and outreach, CCGRS strives to communicate emergent and established

understandings of culture, race, indigeneity, gender, and sexuality to students and society at large, seeking to foster understanding, action, and hope in an unequal and increasingly interconnected world. Its faculty, students, and staff work together to cultivate a community that fosters and respects difference, laying the foundation to question and change the status quo locally and globally. Through the creation and distribution of transdisciplinary, transnational, and transformative knowledge, CCGRS endeavors to illuminate existing racial, gender, and sexual inequities, while empowering its constituencies to envision and realize new futures.

Bachelor of Arts in Comparative Ethnic Studies

Comparative Ethnic Studies embraces interdisciplinary, comparative, and transnational approaches to studying race relations and the intersectionality of race, gender, class, sexuality, and globalization. The course work fosters an in-depth understanding of the complexities of formations of race and culture. The major in comparative ethnic studies prepares students to work and function in the multiracial and multicultural world in which we live. Students majoring in comparative ethnic studies must complete 36 hours in CES, as outlined below. Students interested in declaring a major in should contact the Department.

Student Learning Outcomes

These are listed in our website at <http://www.libarts.wsu.edu/ccgrs/undergraduate/learning-goals.asp>.

- Recognizes and summarizes impact and intersections of race, class, gender, and sexuality.
- Identifies and articulates one's social location in a complex, structurally unequal, and often contradictory world.
- Displays familiarity with multiple perspectives, employs other interpretations, and considers a range of human experiences in analysis.
- Identifies and assesses social norms and assumptions and envisions alternative social norms and practices.
- Asks critical questions and formulates a relevant research plan; accesses information tools to get relevant answers.
- Can articulate and utilize the basic tools and texts of the discipline.
- Examines the influence of historical context on the formation of local, national, and global political and social narratives.
- Active and critical verbal and/or written discussion of issues from scholarly sources.

Bachelor of Arts in Women's Studies

Women's Studies is an interdisciplinary field of research and teaching that places gender at the center of inquiry. Central to the consideration of gender are the ways class, race, ethnicity, nationality, sexual orientation, age, and ability shape the female and male experience. Students learn how female and male social roles affect personal lives, artistic expression, work, social relationships, institutional structures, the production of knowledge, and national and international political and economic relations. A major in women's studies requires a minimum of 36 credit hours. Students interested in declaring a major in should contact the Department.

Student Learning Outcomes

These are listed in our website at <http://www.libarts.wsu.edu/ccgrs/undergraduate/learning-goals.asp>.

- Recognizes and summarizes impact and intersections of race, class, gender, and sexuality.
- Identifies and articulates one's social location in a complex, structurally unequal, and often contradictory world.
- Displays familiarity with multiple perspectives, employs other interpretations, and considers a range of human experiences in analysis.
- Identifies and assesses social norms and assumptions and envisions alternative social norms and practices.
- Asks critical questions and formulates a relevant research plan; accesses information tools to get relevant answers.
- Can articulate and utilize the basic tools and texts of the interdiscipline.
- Examines the influence of historical context on the formation of local, national, and global political and social narratives.
- Active and critical verbal and/or written discussion of issues from scholarly sources.

Undergraduate Minors

CCGRS offers minors in Comparative Ethnic Studies, Queer Studies, Popular Culture, and Women's Studies. Courses for the minor may not be taken pass, fail. Students interested in declaring a minor in should contact the Department.

Graduate Program

The American studies M.A. and Ph.D. degrees offer interdisciplinary approaches to the study of the United States as a multiethnic, multiracial, and multicultural society, embedded in transnational forces. In addition to the American studies curriculum, students can take courses from other departments across the campus. The program offers a broad array of intellectual possibilities, with strengths in critical race/ethnicity studies, gender and sexuality studies, multicultural American West, cultural studies of race, class, gender, sexuality, as well as the critical study of colonialism and empire, critical analysis of popular culture and sport, global indigenous studies, social movements and labor history, social action research, and critical cyber-culture studies. For more information, contact Karen Chase, Washington State University, PO Box 644010, Pullman, WA 99164-4010, 509-335-2605, karen.chase@wsu.edu.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

COMPARATIVE ETHNIC STUDIES (120 HOURS)

First Year

<i>First Term</i>	<i>Hours</i>
CES 201	3
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3
Quantitative Reasoning [QUAN]	3 or 4

<i>Second Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
Diversity [DIVR]	3
HISTORY 105 [ROOT]	3
Social Sciences [SSCI]	3
WOMEN ST 201	3

Second Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
CES Elective ²	3
Foreign Language and/or Electives	6
Humanities [HUM]	3

<i>Second Term</i>	<i>Hours</i>
CES Elective ²	3
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
Foreign Language and/or Electives	6
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
CES 300 [M]	3
300-400-level CES Elective ²	3
CES Sub-core ³	3
Electives	7

<i>Second Term</i>	<i>Hours</i>
CES Sub-core ³	3
300-400-level CES Electives ²	6
300-400-level Electives	6

Fourth Year

<i>First Term</i>	<i>Hours</i>
300-400-level CES Elective ²	3
Electives	12

<i>Second Term</i>	<i>Hours</i>
CES 489 [CAPS]	3
300-400-level Electives	12

¹To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

²Of the six CES Electives, four electives must be CES courses; one must be a WOMEN ST course; cross-listed courses between CES and WOMEN ST may count as either; any unused sub-core courses may fulfill electives. CES Electives are: AMER ST 475; CES 111, 131, 151, 171, 209, 220, 240, 244, 254, 255, 260, 271, 280, 301 [M], 308 [M], 313, 314 [M], 325, 331, 332 [M], 335, 336, 338, 353 [M], 357, 358 [M], 373 [M], 379, 380, 405, 406, 407, 413, 426, 440, 444, 446, 465, 470, 491 [M]; CES /WOMEN ST 372; CES /WOMEN ST 411; CES /WOMEN ST 454; WOMEN ST 211, 220, 308 [M], 309, 310 [M], 317, 332, 336, 338, 340, 363, 403, 406, 460, 464, 481 [M], 484, and 485 [M]; WOMEN ST/CES 120; WOMEN ST 302/CES 305; WOMEN ST 369/CES 309.

³ CES Sub-core courses are (6 Credits): CES 301 [M], 325, 440, 446, and 491 [M]. CES Sub-core

and Electives must include coursework to meet University requirement of 2 [M] courses.

WOMEN'S STUDIES (120 HOURS)

First Year

<i>First Term</i>	<i>Hours</i>
CES 201	3
ENGLISH 101 [WRTG]	3
Social Sciences [SSCI]	3
Electives	4

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
HISTORY 105 [ROOT]	3
Quantitative Reasoning [QUAN]	3 or 4
WOMEN ST 201	3
WOMEN ST Elective ¹	3

Second Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ²	4
Communication [COMM] or Written Communication [WRTG]	3
Foreign Language and/or Electives	3 or 4
Humanities [HUM]	3
WOMEN ST Elective ¹	3

<i>Second Term</i>	<i>Hours</i>
Diversity [DIVR]	3
Foreign Language and/or Electives	3 or 4
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ²	4
WOMEN ST Sub-core ³	3
300-400-level WOMEN ST Electives ¹	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
300-400-level WOMEN ST Elective ¹	3
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
WOMEN ST 300 [M]	3
WOMEN ST Sub-core ³	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
300-400-level WOMEN ST Elective ¹	3
WOMEN ST [M] Course	3
Electives	9

Fourth Year

<i>First Term</i>	<i>Hours</i>
300-400-level WOMEN ST Elective ¹	3
300-400-level Electives	6
Electives	6

<i>Second Term</i>	<i>Hours</i>
WOMEN ST 489 [CAPS]	3
300-400-level Electives	9
Electives	3

¹ Of the six WOMEN ST elective courses, four electives must be WOMEN ST courses; one must be a CES course; cross-listed courses between CES and WOMEN ST may count as either. Any unused sub-core courses may fulfill electives. Four courses must

be at the 300-400-level. WOMEN ST Electives are: AMER ST 475; CES 111, 131, 151, 171, 209, 220, 240, 244, 254, 255, 260, 271, 280, 301 [M], 308 [M], 313, 314 [M], 325, 331, 332 [M], 335, 336, 338, 353 [M], 357, 358 [M], 373 [M], 379, 380, 405, 406, 407, 413, 426, 440, 444, 446, 465, 470, 491 [M]; CES/WOMEN ST 372; CES/WOMEN ST 411; CES/WOMEN ST 454; WOMEN ST 211, 220, 308 [M], 309, 310 [M], 317, 332, 336, 338, 340, 363, 403, 406, 460, 464, 481 [M], 484, and 485 [M]; WOMEN ST/CES 120; WOMEN ST 302/CES 305; WOMEN ST 369/CES 309.

² To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

³ WOMEN ST Sub-core courses are (6 credits): WOMEN ST 332, 369, 406, 481 [M], and WOMEN ST 484 or 485 [M]. WOMEN ST Sub-core and Electives must include coursework to meet University requirement of 2 [M] courses.

Minors

Comparative Ethnic Studies

For the minor in Comparative Ethnic Studies (CES), students must complete either CES 101 or 201, as well as an additional 15 hours of coursework in CES, nine hours of which must be 300-400 level courses taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Popular Culture

For the minor in Popular Culture students must complete a minimum of 21 credit hours, 9 of which must be upper-division course work and taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. Required core courses (12 credit hours): One of CES 101, 201, WOMEN ST 101, or 201; CES/SOC/WOMEN ST 300; CES 260; WOMEN ST 338. Electives (9 credit hours): AMER ST 216, 475, CES 209, 222, 308, 325, 336, 338, 357, 358, 379, 413, WOMEN ST 340, COM/WOMEN ST 464, or WOMEN ST/ENGLISH 211.

Queer Studies

A minimum of 16 hours including a core of WOMEN ST 201, 369, 484, and 485. In addition, four elective hours selected from WOMEN ST 211, 300, 317, 410, 481, 499. At least 9 hours must be in upper-division work and taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Women's Studies

For the minor in Women's Studies, students must complete a minimum of 16 credit hours, 9 of which must be upper-division course work and taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. Required core courses (9 credit hours): WOMEN ST 101 or 201; WOMEN ST 300; and WOMEN ST 481 or 485. Electives (7 credit hours): Any WOMEN ST course not listed in the requirements.

Description of Courses

AMERICAN STUDIES

AMER ST

216 Introduction to American Cultural Studies 3 Introduction to the interdisciplinary study of American cultures and the field of American studies. (Crosslisted course offered as AMER ST 216, ENGLISH 216, HISTORY 216, WOMEN ST 216).

470 Literature and Culture of the American West 3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Junior standing. Cultural exploration of American West in written texts; outsider and insider versions of reality and imagination of its diverse peoples. (Crosslisted course offered as ENGLISH 470, AMER ST 470).

471 Cultural Politics Since World War II 3 American popular culture, politics and culture of the 1960s, or topics in recent cultural politics.

472 Ecological Issues and American Nature Writing 3 Course Prerequisite: Junior standing. Representation of nature in American fiction and nonfiction; role of culture in shaping environmental problems and solutions. (Crosslisted course offered as AMER ST 472, ENGLISH 472).

473 Arts in American Cultures 3 Course Prerequisite: Junior standing. Exploration of visual culture, from fine arts to advertising, as a political, sociological, psychological, and philosophical influence in 20th-century American cultures.

474 Social Movements and US Culture 3 Course Prerequisite: Junior standing. Cultural impact of selected social movements such as abolition, populism, labor, women's, ethnic power, gay/lesbian and anti-globalization.

475 Digital Diversity 3 Course Prerequisite: Junior standing. Cultural impact of electronic media, especially the World-Wide Web; issues of race, class, gender, sexuality online. (Crosslisted course offered as AMER ST 475, DTC 475, ENGLISH 475).

505 Pro Seminar in American Cultural Studies 3 Critical theoretical engagement within an interdisciplinary field; emphasis on professionalism.

506 Frameworks in American Cultural Studies 3 Critical framework for intellectual, theoretical, and political genealogies within American Studies.

507 Contemporary Practices in American Cultural Studies 3 Overview of contemporary practices in American cultural studies; important concepts and major insights within the field.

515 The Neoliberal University 3 Critically considers the pedagogical, professional, institutional, and social effects of neoliberalism on higher education.

520 Colonization, Globalization and Decolonization 3 Topics in the critical study of colonialism, neo-colonialism, imperialism, globalization and resistance to these forces.

521 Critical Studies in Sexuality 3 Topics in the critical analysis of normative sexualities and forces shaping US and global cultures.

522 Digital Cultures, Digital Divides 3 Critical analysis of the social and cultural dimensions of the digital divide and use of digital technologies by dominant and subaltern communities.

523 Environmental Justice Cultural Studies 3 Critical analysis of the cultural dimensions of environmental justice and injustice.

524 Critical Studies in Popular Culture 3 Interdisciplinary approaches to historical and contemporary trends and issues in US popular culture.

525 Social Movements in American Studies 3 Theoretical and historical study of the role of social movement in United States culture.

526 Contemporary Theories of Race and Ethnicity 3 Major theoretical readings and key recent texts in U.S. and transnational ethnic studies scholarship.

527 Contemporary Feminist Theories and Practices 3 Major theoretical readings and key recent texts in U.S. and transnational feminist scholarship.

528 Cultural Studies 3 Basic theory and core methods of the field of cultural studies through a cross discipline approach.

529 Cultural Politics of the Body 3 An interdisciplinary investigation of the historical, sociopolitical, biotechnical, and economic materialities of the human body within and across an array of identity categories.

590 Seminar in American Studies 3 May be repeated for credit; cumulative maximum 9 hours. Interdisciplinary topics in American culture.

596 Topics in American Studies 3 May be repeated for credit; cumulative maximum 9 hours. American Studies Summer Institute. (Crosslisted course offered as AMER ST 596, HISTORY 596).

600 Special Projects or Independent Study V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.

700 Master's Research, Thesis, and/or Examination V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

702 Master's Special Problems, Directed Study, and/or Examination V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the American Studies PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

COMPARATIVE ETHNIC STUDIES

CES

101 [DIVR] Introduction to Comparative Ethnic Studies 3 Comparative issues in Asian American, African American, Chicana/o, and Native American cultures in the United States.

111 [HUM] Introduction to Asian Pacific American Studies 3 Examination of the social, political, economic, and cultural experiences of Asian/Pacific Americans in the historical and contemporary period.

120 [DIVR] Sex, Race, and Reproduction in Global Health Politics 3 Examination of how cultures, institutions, states, and economies influence reproductive health inequalities around gender, sexuality, race, class, and national identity. (Crosslisted course offered as WOMEN ST 120, CES 120).

131 [SSCI] Introduction to Black Studies 3 An introduction to general knowledge concerning African Americans in the US.

151 [HUM] Introduction to Chicano/Latino Studies 3 Examination of the history, culture, political and economic status of Chicano/as and Latino/as in the US.

171 [SSCI] Introduction to Indigenous Studies 3 Introduction to indigenous studies; introductory course to contemporary indigenous cultures and politics.

201 Foundations of Comparative Ethnic Studies 3 Critical examination of the history, methodology and theoretical concepts of ethnic studies.

204 Critical Studies in Whiteness 3 Political and cultural practices that define whiteness through history, popular culture and everyday life.

209 [HUM] Hip Hop Around the Globe 3 Diversity and complexity of hip hop at a local, national and global level.

211 Asian Pacific American History 3 Historical experience of Asian/Pacific Americans since the 19th century. (Crosslisted course offered as CES 211, HISTORY 201).

220 [HUM] Introduction to Multicultural Literature 3 Survey of multicultural literature including European American, African American, Asian American, Chicana/o, and Native American authors. (Crosslisted course offered as CES 220, ENGLISH 220).

222 Race in Sport Films 3 (2-2) Examination of racial politics through critical discussions of sport film.

235 [HUM] African American History 3 History of African Americans in the US with emphasis upon major themes of the Black experience. (Crosslisted course offered as CES 235, HISTORY 235, WOMEN ST 235).

240 Global Indigenous Issues 3 Critical examination of global indigenous politics in a historical perspective.

244 [SSCI] Critical Globalizations 3 Critical examination of the historical trajectory and contemporary practices, institutions and policies that make up globalization.

254 [SSCI] Comparative Latino/a Cultures 3 Comparison of the contemporary and historical experiences of Latinos and Latinas in the United States, and their relations with other ethnic minority groups and the majority populations.

255 Chicana/o History 3 The historical development of the Chicano/a community in relation to the dynamics of race relations, class structure, ethnic identity, gender, and sexuality in American society from 1521 to the 20th century.

260 [HUM] Race and Racism in US Popular Culture 3 Examines images, ideologies, and identities; introduces key concepts and methods; focuses on race, gender, sexuality and class.

271 [HUM] Native Music of North America 3 Music and ceremonialism as a reflection of realities in North American native cultures, past and present. (Crosslisted course offered as MUS 265, CES 271).

280 Race and the Law in American History 3 Introduction to the role of the law in American race-relations since 1750. (Crosslisted course offered as CES 280, HISTORY 280).

291 [DIVR] Anti-Semitism 3 Historical, social, theological, and ideological dimensions of anti-Semitism.

300 [DIVR] [M] Intersections of Race, Class, Gender and Sexuality 3 Course Prerequisite: CES 101, 201, SOC 101, WOMEN ST 101, or 201. Intersections between race, class and gender through case studies; experiences in interdisciplinary methods. (Crosslisted course offered as WOMEN ST 300, CES 300, SOC 300).

301 [M] Race and Global Inequality 3 Examination of nationalism, colonization, empire-building, racism, ethnic conflict, and class inequality in a global context.

302 Social Psychology of Prejudice 3 Causes and nature of prejudice from social, psychological, and cultural theoretical perspectives.

305 Contemporary Masculinities 3 Analysis of the development of masculinity in its biological and cultural forms. (Crosslisted course offered as WOMEN ST 302, CES 305, SOC 302).

308 [SSCI] Cultural Politics of Sport 3 A critical examination of US sports through class, race, gender, sexuality, nationalism and criminality.

309 [ARTS] Queer Identities in Contemporary Cultures 3 Course Prerequisite: CES 101, CES 201, WOMEN ST 101, or WOMEN ST 201. Analysis of roots/legacies of creative resistance writing by Queer communities of color; students learn to produce creative resistance work. (Crosslisted course offered as WOMEN ST 369, CES 309).

313 [HUM] Asian Pacific American Literature 3 Asian American fiction, drama, poetry, and other arts, 1900 to present; impact of Asian/Pacific American culture and experience upon these works. (Crosslisted course offered as CES 313, ENGLISH 311).

314 [M] Topics in Asian Pacific American Literature 3 May be repeated for credit; cumulative maximum 6 hours. Trends, themes, major writers. (Crosslisted course offered as CES 314, ENGLISH 314).

315 [M] Asian Pacific American Autobiography 3 Critical readings of the autobiographical works, memoirs, and life writings by Asian Pacific Americans. (Crosslisted course offered as CES 315, ENGLISH 315).

325 [DIVR] Traveling Cultures: Tourism in Global Perspective 3 Social relations and cultural practices central to tourism with examples from around the world.

330 From Malcolm X to the Black Panthers 3 Complex understanding of the history of black politics in the 1960's.

331 African American Literature 3 Introduction to major issues and major works in the African American literary tradition. (Crosslisted course offered as CES 331, ENGLISH 321).

332 [DIVR] [M] Topics in African American Literature 3 May be repeated for credit; cumulative maximum 6 hours. Trends and major writers. (Crosslisted course offered as ENGLISH 322, CES 332).

335 [SSCI] Black Freedom Struggle 3 Historic exploration of black resistance focusing on nationwide movement that developed following World War II. (Crosslisted course offered as CES 335, HISTORY 313).

336 Black Popular Culture 3 Histories of African American pop culture; examines how African American cultural specificities emerge and transform American popular imaginations.

338 Cinematic Images of Blackness 3 Critical perspectives on the history of cinematic images of blackness; traces experiences of blacks within Hollywood as actor or artist, subject or image.

- 353 [M] Chicana/o - Latina/o Literature 3** Chicana/o and Latina/o literature, narrative, novel, autobiography, poetry, short story, and drama. (Crosslisted course offered as CES 353, ENGLISH 345).
- 357 Chicana/os and Popular Culture 3** Representation of Chicanos in US popular culture.
- 358 [M] US Latino/as in Film 3 (2-3)** Critical analysis of Latinas and Latinos in contemporary US mainstream movies and independent films.
- 359 Chicana/o and Latina/o Politics 3** Character, role, and goals of Chicano/Latino politics; contemporary Chicano/Latino issues. (Crosslisted course offered as CES 359, POL S 375).
- 372 Indigenous Women in Traditional and Contemporary Societies 3** Course Prerequisite: One of ANTH 101, 214, CES 101, 171, or WOMEN ST 101, or WOMEN ST 201. Exploration of roles and activities of women in indigenous societies; how traditional gender roles have developed and changed. (Crosslisted course offered as CES 372, ANTH 312, WOMEN ST 372).
- 373 [M] Native American Literature 3** Native American literature, by and about the original inhabitants, image and counter-image, with emphasis on the 20th century. (Crosslisted course offered as CES 373, ENGLISH 341).
- 377 Native Peoples of North America 3** A culture history/culture area study of native North America. (Crosslisted course offered as ANTH 320, CES 377).
- 378 [DIVR] Contemporary Native Peoples of the Americas 3** Contemporary cultures of Native American communities emphasizing North America. (Crosslisted course offered as ANTH 327, CES 378). Recommended preparation: ANTH 101 or CES 171.
- 379 Indigenous Film 3** Critical examination of films and videos featuring and by indigenous peoples; traces the history of the indigenous peoples as subjects of films and as filmmakers.
- 380 Immigration and Citizenship in the Global Economy 3** Examination of past and current notions of immigration and citizenship in North American, Asian, and European countries as defined by government officials, political organizations, community groups, and popular culture.
- 401 Seminar in Culture and Power 3** Complex power relations that develop among competing local, regional, national, and global culture(s).
- 403 Cultural Issues in Psychology 3** Multidisciplinary analyses of the relationship between social-ecological and political contexts and individual and collective psychology. (Crosslisted course offered as CES 403, PSYCH 403).
- 405 [CAPS] Cultural Criticism and Theory 3** Course Prerequisite: Junior standing. Major critiques and theories of colonialist and imperialist formations of culture. (Crosslisted course offered as CES 405, ENGLISH 410).
- 406 Philosophy and Race 3** Course Prerequisite: 3 hours in PHIL or CES 201. Examination of race within western philosophy including work of philosophers of color and analysis of the category race. (Crosslisted course offered as CES 406, PHIL 406).
- 407 Race, Gender and the Prison Industrial Complex 3** Race, gender and nationality and how they affect the organization and maintenance of the prison industrial complex.
- 408 Introduction to Critical Race Feminism 3** Course Prerequisite: Junior standing. Studies structural inequalities in the US through historically grounded analysis of social systems, race, gender, and the law. (Crosslisted course offered as WOMEN ST 408, CES 408).
- 411 Asian Pacific American Women 3** Course Prerequisite: CES or WOMEN ST course; junior standing. Intersection of ethnicity, race, class, gender and sexuality in the lives of Asian Pacific American women. (Crosslisted course offered as CES 411, WOMEN ST 411).
- 413 Asian Pacific Americans and Popular Culture 3** Course Prerequisite: CES 101 or 111. Examines the racial politics that have developed around the representation of Asian Pacific Americans in US popular culture.
- 426 Workers Across North America 3** Course Prerequisite: Junior standing. International interactions between workers and labor unions in Mexico, Canada and the US. (Crosslisted course offered as CES 426, HISTORY 426).
- 435 African American Women in US Society 3** Course Prerequisite: Junior standing. Critical terms and models for understanding the experiences of African American women in antebellum America to the present; an interdisciplinary forum concerned with the national experience of the African American woman experience. (Crosslisted course offered as CES 435, WOMEN ST 435).
- 436 Black Masculinities 3** Historical, political and cultural constructions of images of black manhood and the effects on black male subjectivity.
- 440 [CAPS] Global Social Justice 3** Course Prerequisite: Junior standing. Examination of social justice issues in the United States and transnationally.
- 442 Nation, Ethnicity, and Modernity 3** Relationship between modernity and nation-making in relation to dominant constructions of race and ethnicity and histories of colonialism.
- 444 White Power Movements and Ideologies 3** Course Prerequisite: Junior standing. Critical assessment of white supremacist and nationalist movements and ideologies around the globe.
- 446 Racism and Anti-Racism in Global Context 3** Theory and practice of anti-racism; history and scope; strategies to transform racist systems.
- 454 La Chicana in US Society 3** Course Prerequisite: Junior standing. Intersections of race, class, gender and sexual orientation in the experience of a marginalized group - Chicanas. (Crosslisted course offered as CES 454, WOMEN ST 454).
- 465 Race, Science, and Society 3** Course Prerequisite: Junior standing. Racial thinking in science tracing the impact of scientific racism on policy, popular thought and social movements.
- 470 Indigenous Politics 3** Course Prerequisite: Junior standing. An overview of the struggles of indigenous people; issues include rights, recognition, identity, natural resources, intellectual property, and repatriation globally.
- 475 Indians of the Northwest 3** Course Prerequisite: ANTH 320, CES 171, 375, 377, or HIST 308; junior standing. History and ethnography of Native Americans of the Coast and Plateau; historic relationship with Europeans and Euro-Americans, and other Native Americans, Asian Americans, and Chicanas/os.
- 485 Special Topics: Study Abroad V 1-15** May be repeated for credit. S, F grading.
- 489 [CAPS] Everyday Struggles for Justice and Equality 3** Course Prerequisite: CES 201 or WOMEN ST 201; junior standing. Investigation of everyday realities of racism, sexism, and heterosexism; applied research; communication of findings through new and/or creative media. (Crosslisted course offered as CES 489, WOMEN ST 489).
- 491 [M] Theories of Racism and Ethnic Conflicts 3** Provides general knowledge of the history of racist ideas and the social, political, and cultural contexts underlying ethnic conflicts.
- 494 Advanced Topics in Ethnic Studies 3** May be repeated for credit; cumulative maximum 9 hours. Course Prerequisite: 3 credits in CES. A reading and discussion course that explores special topics in ethnic studies.
- 495 Special Topics in Comparative Ethnic Studies 3** May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: 3 credits in CES. Cross-cultural studies on Asian Pacific Americans, Blacks, Chicanas/os, and Native Americans.
- 498 Internship in Comparative Ethnic Studies V 1-3** Course Prerequisite: 12 hours of CES; junior standing. Internship component for CES majors and minors. S, F grading.
- 499 Directed Independent Study V 1-4** May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.

WOMEN'S STUDIES**WOMEN ST**

- 101 [DIVR] Gender and Power: Introduction to Women's Studies** 3 Analysis of gender and power in contemporary society from perspectives of different racial, ethnic and socioeconomic groups.
- 120 [DIVR] Sex, Race, and Reproduction in Global Health Politics** 3 Examination of how cultures, institutions, states, and economies influence reproductive health inequalities around gender, sexuality, race, class, and national identity. (Crosslisted course offered as WOMEN ST 120, CES 120).
- 201 Critical Frameworks in Gender Studies** 3 Critical frameworks that interrogate gender discrimination and explore gender justice from an intersectional and interdisciplinary perspective.
- 211 [HUM] Sex Matters: Introduction to Queer Culture and Literature** 3 Introduction to Lesbian/queer cultural production focusing on popular culture, fiction, and film; work from various queer communities in its cultural/historical context. (Crosslisted course offered as WOMEN ST 211, ENGLISH 211).
- 216 Introduction to American Cultural Studies** 3 Introduction to the interdisciplinary study of American cultures and the field of American studies. (Crosslisted course offered as AMER ST 216, ENGLISH 216, HISTORY 216, WOMEN ST 216).
- 220 [DIVR] Gender, Culture and Science** 3 Analysis of intersections of gender, sexuality, race, and culture with science and technology.
- 230 Human Sexuality** 3 Sexuality in personal development; personal, cultural, biological influences on sexual identification and behavior; fertility, reproduction, sexual functioning, sexuality and personality. (Crosslisted course offered as PSYCH 230, WOMEN ST 230). Recommended preparation: PSYCH 105.
- 235 [HUM] African American History** 3 History of African Americans in the US with emphasis upon major themes of the Black experience. (Crosslisted course offered as CES 235, HISTORY 235, WOMEN ST 235).
- 251 The Sociology of Sex, Relationships, and Marriage** 3 Social and personal factors in mate selection; the sociology of sexuality; development of gender roles; and intimate relationships and marriage. (Crosslisted course offered as SOC 251, WOMEN ST 251).
- 277 Special Topics: Study Abroad** V 1-15 May be repeated for credit. S, F grading.
- 298 [DIVR] History of Women in American Society** 3 Exploration of the many roles women have played in American society from the Colonial period through the twentieth century. (Crosslisted course offered as HISTORY 298, WOMEN ST 298).
- 300 [DIVR] [M] Intersections of Race, Class, Gender and Sexuality** 3 Course Prerequisite: CES 101, 201, SOC 101, WOMEN ST 101, or 201. Intersections between race, class and gender through case studies; experiences in interdisciplinary methods. (Crosslisted course offered as WOMEN ST 300, CES 300, SOC 300).
- 302 Contemporary Masculinities** 3 Analysis of the development of masculinity in its biological and cultural forms. (Crosslisted course offered as WOMEN ST 302, CES 305, SOC 302).
- 306 [M] Introduction to Literary Criticism** 3 Introduction to the systematic study of critical and theoretical approaches to literature; emphasis on problems of interpretation. (Crosslisted course offered as ENGLISH 308, WOMEN ST 306).
- 308 [M] Women Artists I** 3 Middle Ages through the 18th century. (Crosslisted course offered as FINE ART 308, WOMEN ST 308).
- 309 Women Writers** 3 Women's artistic and intellectual contributions to prose, fiction, drama, and poetry. (Crosslisted course offered as ENGLISH 309, WOMEN ST 309).
- 310 [M] Women Artists II** 3 19th to 20th century. (Crosslisted course offered as FINE ART 310, WOMEN ST 310).
- 316 [DIVR] Gender in Cross Cultural Perspective** 3 Cross-cultural examination of the status and roles of women and men, sexuality and marriage, and folk concepts of sexual anatomy in traditional cultures in Western science; concepts of nature and culture are explored through a variety of perspectives. (Crosslisted course offered as ANTH 316, WOMEN ST 316). Recommended preparation: Sophomore standing; ANTH 101, PSYCH 105, SOC 101, or WOMEN ST 101 or 201.
- 317 Gay and Lesbian Literature** 3 Gay and lesbian literature with focus on the history of homosexual literature and exploration of current authors. (Crosslisted course offered as ENGLISH 317, WOMEN ST 317).
- 321 Topics in Women's Studies** V 1-3 May be repeated for credit; cumulative maximum 9 hours. Focused study of subjects/issues relating to women.
- 324 Psychology of Gender** 3 Contemporary overview of the psychological theory and research on sex and gender. (Crosslisted course offered as PSYCH 324, WOMEN ST 324). Recommended preparation: PSYCH 105.
- 332 Global Feminisms** 3 Course Prerequisite: ANTH 101, WOMEN ST 101, or WOMEN ST 201. An interdisciplinary approach to examining women's roles and experiences throughout the world and different approaches to feminism/feminisms. (Crosslisted course offered as WOMEN ST 332, ANTH 317).
- 335 [DIVR] Women in Latin American History** 3 Survey of women's changing roles throughout Latin America from pre colonial to present. (Crosslisted course offered as HISTORY 335, WOMEN ST 335).
- 336 History of Sexualities** 3 Historical analysis of the social construction of sexualities in intersection with race and class within national and transnational contexts. (Crosslisted course offered as WOMEN ST 336, HISTORY 336).
- 338 [HUM] Women and Popular Culture** 3 Intersections of gender, race, class and sexuality through popular film, television, art, literature and performance.
- 340 Third World Women and Film** 3 Focus on the intersections of race, gender, class, sexuality, and nation in third world women's films.
- 350 European Women's History, 1400-1800** 3 Women's experiences in Europe from the Renaissance to the Enlightenment and the ideas and roles that shaped their opportunities. (Crosslisted course offered as HISTORY 350, WOMEN ST 350).
- 351 [DIVR] The Family** 3 Family system and its interaction patterns; family formation and dissolution; marital and partner relations, divorce, sexuality, parenting, work-family balance. (Crosslisted course offered as SOC 351, WOMEN ST 351). Recommended preparation: SOC 101.
- 363 [DIVR] Women in Music** 3 Intersections of gender, class, race, and culture with popular and country music. (Crosslisted course offered as MUS 363, WOMEN ST 363).
- 369 [ARTS] Queer Identities in Contemporary Cultures** 3 Course Prerequisite: CES 101, CES 201, WOMEN ST 101, or WOMEN ST 201. Analysis of roots/legacies of creative resistance writing by Queer communities of color; students learn to produce creative resistance work. (Crosslisted course offered as WOMEN ST 369, CES 309).
- 372 Indigenous Women in Traditional and Contemporary Societies** 3 Course Prerequisite: One of ANTH 101, 214, CES 101, 171, or WOMEN ST 101, or WOMEN ST 201. Exploration of roles and activities of women in indigenous societies; how traditional gender roles have developed and changed. (Crosslisted course offered as CES 372, ANTH 312, WOMEN ST 372).
- 382 American Literature: 1940-Present** 3 Course Prerequisite: ENGLISH 302. Advanced study of major authors and movements from the period including O'Connor, Bellow, Salinger, Baldwin, Pynchon, Morrison, Tan, and Alexie. (Crosslisted course offered as ENGLISH 482, WOMEN ST 382).
- 384 Sociology of Gender** 3 Construction and maintenance of gender and gender inequality in American society. (Crosslisted course offered as SOC 384, WOMEN ST 384). Recommended preparation: SOC 101.
- 390 Gender and Work** 3 Gender and inequality at work including occupational segregation, wage inequality and balancing work and family. (Crosslisted course offered as SOC 390, WOMEN ST 390).
- 398 [DIVR] History of Women in the American West** 3 The multicultural history of women in the west through women's literature, archives, and oral history. (Crosslisted course offered as HISTORY 398, WOMEN ST 398).

- 399 [DIVR] Lesbian and Gay History: Culture, Politics and Social Change in the US 3** History and theory of same-sex sexuality in the United States including identity formation, community development, politics and culture. (Crosslisted course offered as HISTORY 399, WOMEN ST 399).
- 403 [CAPS] Violence Toward Women 3** Course Prerequisite: Junior standing. Violence toward women and its relationship to broader social issues such as sexism and social control. (Crosslisted course offered as CRM J 403, WOMEN ST 403).
- 406 Women and Work In Global Contexts 3** Course Prerequisite: Junior standing. An interdisciplinary approach to women's labor in global contexts that analyzes differences among women as well as possible shared interests.
- 407 [BSCI] Biology of Women 3** Course Prerequisite: BIOLOGY 102 or 106; junior standing. Biological basis of sex and its relationship to body function, women and health care, and the impact of social and cultural perspectives on the experience of being female. (Crosslisted course offered as BIOLOGY 407, WOMEN ST 407).
- 408 Introduction to Critical Race Feminism 3** Course Prerequisite: Junior standing. Studies structural inequalities in the US through historically grounded analysis of social systems, race, gender, and the law. (Crosslisted course offered as WOMEN ST 408, CES 408).
- 409 Women Writers in the American West 3** Course Prerequisite: Junior standing. Diversity of writings by women in the trans-Missouri West from the 1890s to the present. (Crosslisted course offered as ENGLISH 409, WOMEN ST 409).
- 410 Internship V 1-12** May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: WOMEN ST 101 or 201; WOMEN ST 300 with a B or better, or 481 with a B or better; by interview only. Supervised experience in approved campus or community agencies or projects focusing on women's issues.
- 411 Asian Pacific American Women 3** Course Prerequisite: CES or WOMEN ST course; junior standing. Intersection of ethnicity, race, class, gender and sexuality in the lives of Asian Pacific American women. (Crosslisted course offered as CES 411, WOMEN ST 411).
- 422 [DIVR] Fat Studies 3** Course Prerequisite: Junior standing. Examination of weight based oppression as a social justice issue with other systems of oppression based on gender, race, class, age, sexual orientation, and ability. (Crosslisted course offered as AMDT 422, WOMEN ST 422).
- 425 Philosophy and Feminism 3** Course Prerequisite: 3 hours PHIL, WOMEN ST 101, or WOMEN ST 201. Feminist philosophy as critique of Western philosophical tradition and as alternate framework for thought. (Crosslisted course offered as PHIL 425, WOMEN ST 425).
- 435 African American Women in US Society 3** Course Prerequisite: Junior standing. Critical terms and models for understanding the experiences of African American women in antebellum America to the present; an interdisciplinary forum concerned with the national experience of the African American woman experience. (Crosslisted course offered as CES 435, WOMEN ST 435).
- 454 La Chicana in US Society 3** Course Prerequisite: Junior standing. Intersections of race, class, gender and sexual orientation in the experience of a marginalized group - Chicanas. (Crosslisted course offered as CES 454, WOMEN ST 454).
- 460 Gender, Race, and Nature in American Culture 3** Course Prerequisite: WOMEN ST 101, 201, or 300; junior standing. Exploration of cultural representations of nature in mainstream and environmental politics.
- 462 [M] Women and Ethics 3** Course Prerequisite: PHIL 101, WOMEN ST 101, or WOMEN ST 201. Study of gender and feminism and their effect on contemporary ethical theories and issues. (Crosslisted course offered as WOMEN ST 462, PHIL 462). Cooperative: Open to UI degree-seeking students.
- 464 Gender and the Media 3** Course Prerequisite: COM 101, WOMEN ST 101, or WOMEN ST 201; certified major or minor in communication. How news and entertainment media shape and reinforce societal expectations of gender; consideration of race, age, class, and sexual orientation. (Crosslisted course offered as COM 464, WOMEN ST 464).
- 477 Special Topics: Study Abroad V 1-15** May be repeated for credit. S, F grading.
- 481 [M] Theoretical Issues in Women's Studies 3** Course Prerequisite: WOMEN ST 101, 201, or 300. Introduction to the field of feminist theory, including classic interdisciplinary methods, and applications of this scholarship to contemporary women's issues.
- 484 [DIVR] Introduction to Lesbian, Gay, Bisexual, and Transgender Studies 3** Course Prerequisite: Junior standing. Interdisciplinary exploration of issues related to gender and sexuality, explored transhistorically and cross-culturally, including race, class and age differences. (Crosslisted course offered as WOMEN ST 484, SOC 484).
- 485 [M] Theoretical Issues in Gay and Lesbian Studies 3** Course Prerequisite: WOMEN ST 484 or 300-400-level WOMEN ST course. Theoretical construction and interpretation of sexualities, gender, and identity.
- 489 [CAPS] Everyday Struggles for Justice and Equality 3** Course Prerequisite: CES 201 or WOMEN ST 201; junior standing. Investigation of everyday realities of racism, sexism, and heterosexism; applied research; communication of findings through new and/or creative media. (Crosslisted course offered as CES 489, WOMEN ST 489).

499 Special Problems V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.

Department of Crop and Soil Sciences

css.wsu.edu

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Professor and Interim Department Chair, R. T. Koenig. CROP SCIENCE: Professors, K. S. Gill, S. Hulbert, P. W. Jacoby, S. S. Jones, K. K. Kidwell, D. Lyon, M. M. Neff, W. F. Schillinger; Associate Professors, I. C. Burke, A.H. Carter, S. C. Fransen, T. W. Miller, M. O. Pumphrey; Assistant Professors, K. M. Murphy, K. Sanguinet, Z. Zhang; Assistant Research Professor, P. Fuerst. SOIL SCIENCE: Regents Professor, J. Reganold; Professors, J. R. Davenport, M. Flury, J. B. Harsh, W. L. Pan; Associate Professors, D. Brown, L. Carpenter-Boggs; Assistant Professors, T. S. Sullivan, H. Tao; Instructors, C. Perillo, M. Quimm. AGRICULTURE AND FOOD SYSTEMS: Associate Professor, J. Goldberger; Assistant Professor, C. Carraway; Senior Instructor, J. Duffey; Instructor, J. D. Baser. ADJUNCT AND AFFILIATE FACULTY: R. Abi-Ghanem, B. Baik, H. Bolton, R. A. Boydston, R. Bricklemyer, C. Campbell, D. Cobos, D. Collins, H. Collins, C. Coyne, N. Embertson, K. Garland-Campbell, J. Hu, D. Huggins, M. Islam, D. Jarvis, R. C. Johnson, A. C. Kennedy, T. Kisha, J. Lafferty, R. McGee, P. N. Miklas, C. F. Morris, F. Muehlbauer, C. D. Pannkuk, C. Reardon, D. Roberts, R. Rupp, B. Sharratt, D. Z. Skinner, G. K. Stahnke, C. Steber, J. D. Strubel, F. L. Young. PROFESSORS EMERITI: R. Allan, J. Burns, C. G. Cogger, R. J. Cook, B. E. Frazier, S. O. Guy, A. Hang, W. J. Johnston, A. Kleinhofs, S. Kuo, T. Lumpkin, R. Parker, F. Pierce, R. G. Stevens, M. K. Swan, S. E. Ullrich, D. von Wettstein.

The Department of Crop and Soil Sciences supports undergraduate programs of study leading to the Bachelor of Science interdisciplinary degrees in Integrated Plant Sciences and Agricultural and Food Systems. Students are encouraged to participate as part-time employees in research programs and seek professional internships for applied learning experiences. Departmental and college scholarships are available based on ability, need, and interest. Students gain professional and social contacts with the faculty and other students through student clubs and other activities. Students planning to transfer to Washington State University should take courses that meet general university and Integrated Plant Sciences or Agricultural and Food Systems core requirements.

Undergraduate minors in Crop Science, Soil Science, Geospatial Analysis, and Agricultural and Food Systems, as well as an undergraduate Certificate in Organic Agriculture, are also available.

We offer graduate programs of study leading to the degrees of Master of Science in Crop Science, Master of Science in Soil Science, Doctor of Philosophy

(Crop Science), and Doctor of Philosophy (Soil Science). A graduate Certificate in Sustainable Agriculture is also available.

INTEGRATED PLANT SCIENCES

The science of plant life from molecule to market is the focus of the new Integrated Plant Sciences (IPS) Degree program. Delivered collaboratively by departments within the College of Agricultural, Human, and Natural Resource Sciences, the IPS degree provides students with an exciting depth and breadth of knowledge that crosses a variety of plant science disciplines, including crop and soil sciences, horticulture and landscape architecture, entomology, plant pathology, and food science. Students pursuing a Bachelor of Science degree in Integrated Plant Sciences may choose among seven majors. Information regarding the IPS majors, including student learning outcomes, is available under the Integrated Plant Sciences catalog section and <http://ips.wsu.edu>.

Agricultural Biotechnology

The Agricultural Biotechnology major in IPS is a designed for students interested in careers that include laboratory or research technicians in plant biotechnology, breeding, genetics, entomology, plant pathology, molecular biology, and physiology, as well as for students preparing for advanced degrees in these areas. The program emphasizes the development and application of new technology to ensure a safe and abundant food and fiber supply. Students may find employment in industry, government, or university laboratories.

Field Crop Management

The Field Crop Management major in IPS is ideal for students interested in agronomy, crop production, and plant, soil, and pest management. Crop scientists (or agronomists) are involved in improving food, feed, and fiber production. Graduates qualify for careers in agribusiness, corporate and technical farm management, professional consulting, research, and sales positions.

Turfgrass Management

The Turfgrass Management major in IPS is geared toward students interested in pursuing careers as golf course managers, athletic field managers, or personnel managers in those venues. Students will take courses in turf management, turf production, plant pathology, entomology, soil fertility, and plant breeding to learn how to maintain healthy turfgrass systems. Additionally, students gain hands-on experience at the Palouse Ridge Golf Course, an 18-hole championship golfing facility at the Pullman campus.

AGRICULTURAL FOOD SYSTEMS

The Agricultural and Food Systems (AFS) program is an exciting, college-wide, interdisciplinary program that offers a Bachelor of Science degree with five majors and a Master of Science degree. Information regarding the AFS majors, including student learning outcomes, is available in the Agricultural and Food Systems catalog section and <http://afs.wsu.edu>.

Agricultural Education

Combining the best of both agriculture and teaching, the Agricultural Education major in AFS

prepares students to educate the next generation of agricultural leaders and consumers. Highly sought after by employers, they teach high school and middle school agricultural science classes, as well as serve as FFA advisors, adult education instructors, community outreach coordinators, university extension agents, and agricultural industry representatives.

Agricultural Technology and Production Management

Students in the Agricultural Technology and Production Management hands-on major in AFS gain a science-based overview of agriculture and food systems, with an emphasis on the practical application of technology to agricultural production systems. The program combines students' inherent creativity and interest in physical and biological sciences, technology, mathematics, business, and related subjects with their desire to develop innovative solutions to a variety of agricultural problems.

Organic Agricultural Systems

Significantly different than conventional agriculture, organic food production is one of the fastest growing segments of agriculture, with retail sales generally increasing by 10 to 20 percent annually since 1991. Washington State has been a leader in this burgeoning new industry. This revolutionary new major is the first of its kind to be offered in the United States. Students in the Organic Agricultural Systems major in AFS take a diverse array of courses in the natural, environmental, economic, and social sciences, as well as a number of courses focused on organic production practices.

PREPARATION FOR GRADUATE STUDENTS IN CROP AND SOIL SCIENCES

Preparation for graduate study requires the selection of courses that will benefit later work toward a Master of Science or a Doctor of Philosophy degree. Normally, preparation for an advanced degree in crop science includes course work with a strong emphasis in plant sciences, biochemistry, computer science, genetics, and statistics. Preparation for an advanced degree in soil science includes course work in chemistry, physical sciences, statistics, and soil science.

Minors

Crop Science

A minor in crop science may be obtained by students from this and other departments. A minimum of 16 credit hours for the minor must include 9 hours of upper-division work taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. See crop science advisor.

Geospatial Analysis

The minor requires a minimum of 16 semester hours including the following core: SOIL SCI 368, 374 and SOIL SCI/NATRS 468/568; and 6 hours from the following: AGTM 405, LND ARCH 525, NATRS 464/564, SOIL SCI 451, 508. Exceptional students may take graduate-level courses with

instructor permission. Courses used for the minor in geospatial analysis may not be used for the minor in soils sciences. At least 9 hours must be 300-400-level work taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Soil Science

A minor in soil science may be obtained by students from this and other departments. Sixteen semester hours in soils is required, at least 9 of which must be in 300-400-level courses taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. See soil science advisor.

Description of Courses

CROP SCIENCE

CROP SCI

102 Introduction to Cultivated Plants 3

Exploring cultivated plant classification and morphology, crop reproduction, basic plant processes, and the biotic and abiotic factors which can influence these processes. (Crosslisted course offered as HORT 102, CROP SCI 102).

202 Crop Growth and Development 4

(3-3) Course Prerequisite: HORT/ CROP SCI 102. Morphology, anatomy, growth and development of agronomic and horticultural crops. (Crosslisted course offered as HORT 202, CROP SCI 202).

301 Turfgrass Management 3 (2-3) Course

Prerequisite: BIOLOGY 102, 106, 107, or 120. Principles of establishment and management of turf for lawns, parks, and golf courses. Field trip required. Cooperative: Open to UI degree-seeking students.

302 Forage Crops 3 (2-3) Course Prerequisite:

BIOLOGY 102, 106, 107, 120, or 135. Adaptation, production, and utilization of forage crops. Field trip required.

305 Ecology and Management of Weeds 3

(2-3) Course Prerequisite: HORT 202 or AFS 201. Weed ecology/management in crop and non-crop systems; weed growth/development, identification, weed control (chemical, mechanical, biological), and environmental issues

360 World Agricultural Systems 3 Course

Prerequisite: 3 units of [BSCI] UCORE. Study of agro-environmental characteristics of world agriculture; historical and contemporary features of world food production. (Crosslisted course offered as CROP SCI 360, SOIL SCI 360). Cooperative: Open to UI degree-seeking students.

401 [M] Turfgrass Science 3 Course Prerequisite:

CROP SCI 301. Integration of the principles of turfgrass science into turf management for environmental stewardship of turfgrass systems. Cooperative: Open to UI degree-seeking students.

- 403 Advanced Cropping Systems** 3 Course Prerequisite: HORT 202. Understanding the management of constraints to crop production and quality; biological, physical, and chemical approaches to crop health management. Field trips required. (Crosslisted course offered as CROP SCI 403, PL P 403). Recommended preparation: CROP SCI 305; PL P 429. Cooperative: Open to UI degree-seeking students.
- 411 [M] Crop Environment Interactions** 3 Course Prerequisite: HORT 202. Effects of environment and management on crop growth and development.
- 412 Seminar** 1 May be repeated for credit. Current literature and reports on research or special topics. (Crosslisted course offered as CROP SCI 412, SOIL SCI 412).
- 443 Plant Breeding for Organic Agriculture** 3 Course Prerequisite: HORT 202; BIOLOGY 106 or 120. Concepts and practice of breeding in and for organic agriculture with an emphasis on field-based, on-farm techniques.
- 445 [M] Plant Breeding** 4 Genetic principles underlying plant breeding and an introduction to the principles and practices of plant breeding. (Crosslisted course offered as CROP SCI 445, HORT 445).
- 480 Plant Genomics and Biotechnology** 3 Course Prerequisite: BIOLOGY 420. Advanced concepts in plant genomics and biotechnology with emphasis on approaches, techniques, and application. (Crosslisted course offered as HORT 480 and CROP SCI 480). Recommended preparation: MBIOS 301 or CROP SCI 444.
- 495 Research Experience** V 1-4 May be repeated for credit; cumulative maximum 12 hours. Planned and supervised undergraduate research experience. (Crosslisted course offered as CROP SCI 495, HORT 495, SOIL SCI 495).
- 497 Special Topics: Study Abroad** V 1-15 May be repeated for credit. S, F grading.
- 498 Professional Internship** V 1-6 May be repeated for credit; cumulative maximum 9 hours. Planned and supervised professional work experience. S, F grading.
- 499 Special Problems** V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 503 Advanced Cropping Systems** 3 Understanding the management of constraints to crop production and quality; biological, physical, and chemical approaches to crop health management. Field trips required. (Crosslisted course offered as CROP SCI 403, PL P 403). Recommended preparation: CROP SCI 305; PL P 429. Cooperative: Open to UI degree-seeking students.
- 504 Plant Transmission Genetics** 3 Transmission of genes across generations; detailed study of the basic laws of genetics to predict and describe inheritance. Cooperative: Open to UI degree-seeking students.
- 505 Advanced Classical and Molecular Breeding** 3 Characterization and principles of improving crop quality and adaptation traits with emphasis on molecular breeding strategies. Required preparation must include upper-division course in biology, genetics, or plant breeding. Cooperative: Open to UI degree-seeking students.
- 510 Seminar** 1 May be repeated for credit. Literature review; preparation and presentation of reports in crop science.
- 511 Science Writing Workshop** 2 Instruction, tools, and peer review support to write graduate research proposal or journal article. (Crosslisted course offered as CROP SCI 511, SOIL SCI 511). S, F grading.
- 512 Topics in Crop Science** V 1-2 May be repeated for credit. Concepts of plant breeding, seed physiology, and technology; crop physiology and management.
- 545 Statistical Genomics** 3 Concepts and applications in modern breeding programs.
- 555 Epigenetics in Plants** 2 Understanding principles of epigenetics in plants with a focus on its role in understanding and improving plant genomes and their adaptation to the changing environment. Recommended preparation: General genetics. Cooperative: Open to UI degree-seeking students.
- 600 Special Projects or Independent Study** V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination** V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 702 Master's Special Problems, Directed Study, and/or Examination** V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.
- 800 Doctoral Research, Dissertation, and/or Examination** V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Crop Science PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.
- SOIL SCIENCE**
- SOIL SCI**
- 101 Organic Gardening and Farming** 3 Principles and production practices of organic gardening and farming. Cooperative: Open to UI degree-seeking students.
- 201 [BSCI] Soil: A Living System** 3 Biological, chemical, and physical properties of soils; fundamentals of soil ecology, soil-water-plant relations, soil fertility, and soil genesis.
- 202 [BSCI] Introductory Soil Science Laboratory** 1 (0-3) Course Prerequisite: SOIL SCI 201 or concurrent enrollment. Hands-on experience with biological, chemical, and physical properties/processes of soils including: sampling and evaluating, working with data, and exploring methodology.
- 302 [M] Introduction to Agroecology** 3 Agroecological crop production through case study analyses and applications of ecological principles in traditional and modern farming systems. (Crosslisted course offered as SOIL SCI 302, AFS 302). Recommended preparation: SOIL SCI 201.
- 360 World Agricultural Systems** 3 Course Prerequisite: 3 units of [BSCI] UCORE. Study of agro-environmental characteristics of world agriculture; historical and contemporary features of world food production. (Crosslisted course offered as CROP SCI 360, SOIL SCI 360). Cooperative: Open to UI degree-seeking students.
- 368 Introduction to Geographic Information Systems** 3 (2-3) Course Prerequisite: 3 credits of [BSCI] or [PSCI] UCORE. Introduction to geographic information systems applied to landscape data; geographic coordinate systems and projections, make maps and use geodatabases.
- 374 Remote Sensing and Airphoto Interpretation** 3 (2-3) Course Prerequisite: 3 credits of [BSCI] or [PSCI] UCORE. Physical basis of remote sensing, fundamentals of aerial photography and image analysis applied to agriculture, forestry, wildland management problems.
- 412 Seminar** 1 May be repeated for credit. Current literature and reports on research or special topics. (Crosslisted course offered as CROP SCI 412, SOIL SCI 412).
- 414 Environmental Biophysics** 2 Physical environment of living organisms (temperature, humidity, radiation, wind); heat and mass exchange and balance in plant and animal systems. Recommended preparation: Introductory biology, physics, and calculus. Cooperative: Open to UI degree-seeking students.
- 415 Environmental Biophysics Laboratory** 1 (0-3) Course Prerequisite: SOIL SCI 414 or concurrent enrollment. Experimental methods and procedures in environmental measurements; temperature, wind, radiation, and humidity measurements in biological environments. Cooperative: Open to UI degree-seeking students.

- 441 Soil Fertility 3** Course Prerequisite: SOIL SCI 201. Nutrient management impacts on crop productivity, soil and water quality; mineral requirements; soil testing; plant analysis; inorganic and organic fertilizers.
- 442 Soil Fertility Laboratory 2** (1-3) Course Prerequisite: SOIL SCI 441 or concurrent enrollment. Laboratory exercises and methodology for characterization of soil fertility and chemistry including CEC, acidity, carbon, nitrogen, and plant nutrients. Recommended preparation: CHEM 220.
- 452 The Landscape of Soil 3** (2-3) Course Prerequisite: SOIL SCI 201. The study of soils as natural bodies, including morphology, formation, and classification. A five-day field trip is required.
- 468 GIS Spatial Analysis 4** (2-6) Course Prerequisite: SOIL SCI 368. Geographic information systems applied to analysis of landscape data; maps, geographic coordinate systems and projections, geodatabases. (Crosslisted course offered as SOIL SCI 468, SOIL SCI 568, ENVR SCI 486, ENVR SCI 586). Credit not granted for both SOIL SCI 468 and 568, or ENVR SCI 486 and 586.
- 478 Advanced Organic Farming and Gardening 2** Course Prerequisite: SOIL SCI 101. Advanced training in organic certification and planning for organic farming.
- 479 Organic Farm and Garden Field Management 2** Course Prerequisite: SOIL SCI 478. Advanced training in production management for organic farms and gardens. Typically offered: Summer.
- 480 Practicum in Organic Agriculture V** 1-6 May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: SOIL SCI 478 or concurrent enrollment. Applied principles and practices of organic agriculture; immersion and participation in all required farming/gardening activities.
- 495 Research Experience V** 1-4 May be repeated for credit; cumulative maximum 12 hours. Planned and supervised undergraduate research experience. (Crosslisted course offered as CROP SCI 495, HORT 495, SOIL SCI 495).
- 498 Professional Internship V** V 1-6 May be repeated for credit; cumulative maximum 9 hours. Planned and supervised professional work experience. S, F grading.
- 499 Special Problems V** 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 501 Seminar 1** May be repeated for credit. Presentation of research information.
- 502 Advanced Topics in Soils V** 1-3 May be repeated for credit; cumulative maximum 6 hours. Interpretation, presentation, and discussion of current research on soils, uses, and management.
- 503 Advanced Soil Analysis V** 1-3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: By permission only. Soil research techniques; application of modern instrumentation to soil analysis.
- 505 Teaching Practicum 1** May be repeated for credit; cumulative maximum 4 hours. Supervised experience in classroom teaching; classroom preparation for lectures, discussions, laboratories; preparation and grading of exams. S, F grading.
- 508 Environmental Spatial Statistics 3** Theoretical introduction and practical training in spatial data analysis for graduate students in the environmental sciences. (Crosslisted course offered as SOIL SCI 508, STAT 508). Required preparation must include undergraduate statistics through applied multiple regression. Cooperative: Open to UI degree-seeking students.
- 511 Science Writing Workshop 2** Instruction, tools, and peer review support to write graduate research proposal or journal article. (Crosslisted course offered as CROP SCI 511, SOIL SCI 511). S, F grading.
- 513 Environmental Soil Physics 3** (2-3) Physical properties of soils and their relationships to moisture, aeration, and temperature; plant-soil-atmospheric relationships; solute transport and soil salinity. Recommended preparation: SOIL SCI 201 and general physics.
- 514 Environmental Biophysics 2** Physical environment of living organisms (temperature, humidity, radiation, wind); heat and mass exchange and balance in plant and animal systems. Recommended preparation: Introductory biology, physics, and calculus. Cooperative: Open to UI degree-seeking students.
- 515 Environmental Biophysics Laboratory 1** (0-3) Course Prerequisite: SOIL SCI 514 or concurrent enrollment. Experimental methods and procedures in environmental measurements; temperature, wind, radiation, and humidity measurements in biological environments. Cooperative: Open to UI degree-seeking students.
- 521 Physical Chemistry of Soils 3** Chemical equilibrium and kinetics of soil solution speciation, mineral precipitation and dissolution, adsorption and partitioning reactions, and ion exchange. Soil constituents; soil solutions: mineral equilibria; absorption reactions; acid/base reactions; oxidation-reduction; soil contaminants. Cooperative: Open to UI degree-seeking students.
- 531 Soil Microbiology 3** (2-3) Biology and significance of organisms inhabiting soil and their role in nutrient cycling, ecosystem function, agriculture, and bioremediation.
- 533 Advanced Vadose Processes 2** Methods and models for water, heat, vapor and solute transport in the vadose zone; transfer functions to describe solute transport; non-linear parameter estimation; fate and transport of water, heat, and solutes in the vadose zone; hydrological and geochemical processes in unsaturated subsurface materials. Recommended preparation: upper division or graduate course in soil physics or chemistry.
- 541 Soil-Plant-Microbial Interactions 3** Soil-plant-microbial relationships to plant nutrition, plant health, and environmental cleanup; rhizosphere chemistry and microbial ecology. Required preparation must include two upper-division courses in biology, microbiology or soils.
- 544 Nitrogen Cycling in the Earth's Systems 3** Nitrogen dynamics in terrestrial, aquatic, and atmospheric systems; nitrogen transformations in natural and managed systems and responses to human activities. (Crosslisted course offered as BIOLOGY 544, SOIL SCI 544).
- 547 Soil Fertility Management 3** Philosophy of fertilizer recommendations based on soil and plant tissue testing; principles of fertilizer manufacture, placement and use. Required preparation must include introductory soils and upper-division soil fertility courses. Cooperative: Open to UI degree-seeking students.
- 568 GIS Spatial Analysis 4** (2-6) Geographic information systems applied to analysis of landscape data; maps, geographic coordinate systems and projections, geodatabases. (Crosslisted course offered as SOIL SCI 468, SOIL SCI 568, ENVR SCI 486, ENVR SCI 586). Credit not granted for both SOIL SCI 468 and 568, or ENVR SCI 486 and 586.
- 574 Remote Sensing and Geospatial Analysis 3** (1-4) Digital image processing theory and geographic information systems applied to landscape analysis. Cooperative: Open to UI degree-seeking students.
- 600 Special Projects or Independent Study V** 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination V** 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

702 Master's Special Problems, Directed Study, and/or Examination V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Soil Science PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Dance Courses

Description of Courses

DANCE

DANCE

210 Jazz Dance I 1 (0-3) May be repeated for credit; cumulative maximum 6 hours. Basic jazz dance techniques, stage choreography, and performance.

211 Modern Dance I 1 (0-3) May be repeated for credit; cumulative maximum 6 hours. Basic modern dance techniques, stage choreography, and performance.

310 Jazz Dance II 1 (0-3) May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: By audition only. Advanced jazz dance techniques, stage choreography, and performance.

School of Design and Construction

sdc.wsu.edu
Carpenter Hall
509-335-5539

Architecture + Interior Design + Landscape Architecture + Construction Management

DIRECTOR: J. P. Gruen. ARCHITECTURE: Program Head and Professor, D. Wang; Graduate Program Head and Professor, M. Cohen; Professors, P. Hirzel, B. Kazimee, G. Kessler, R. Samizay; Associate Professors, J. Abell, J. P. Gruen, T. Miyasaka, A. Rahmani; Assistant Professor, M. Ghandi; Clinical Associate Professor, D. Griechen; Instructors, O. Al-Hassawi, N. Frye. INTERIOR DESIGN: Program Head and Associate Professor, M. Melcher; Associate Professors, R. Krikac, J.

Theodorson; Assistant Professors, S. Kalantari, K. Ryan; Clinical Assistant Professor, C. Vielle; Instructor, G. Ebbini. LANDSCAPE ARCHITECTURE: Program Head and Associate Professor, J. Kaytes; Assistant Professors, M. Sanchez, H. Rising; Clinical Assistant Professor, S. Austin. CONSTRUCTION MANAGEMENT: Program Head and Assistant Professor, J. Peschel; Associate Professors, D. Gunderson, W. M. Kirk; Assistant Professors, A. Anderson, R. Cherf, G. Okere.

The School of Design and Construction (SDC) offers collaborative learning experiences for students in architecture, interior design, landscape architecture, and construction management to design and construct places in our environment. The integrated model teaches students the skill sets required for their chosen design major while giving students a substantial advantage when entering the job market.

Programs of study in the SDC lead to the following degrees: a Bachelor of Science in Architectural Studies (a four-year pre-professional degree) followed by a one-, two-, or three-year professional Master of Architecture degree that is accredited by the National Architectural Accreditation Board (NAAB); a Bachelor of Arts in Interior Design accredited by the Council for Interior Design Accreditation (CIDA); a Bachelor of Landscape Architecture accredited by the American Society of Landscape Architects (ASLA); and a Bachelor of Science in Construction Management (a four-year degree) that is accredited by the American Council for Construction Education (ACCE). The SDC also offers a Master of Arts in Interior Design.

Study tours are an integral component of the SDC's curriculum. It is important that students be able to visit and experience the places, ideas, and cultures that are presented in the classroom. Students participate in a variety of discipline-specific and collaborative tours during their education. Appropriate course fees are charged to cover the costs for each experience. Study abroad may be incorporated into the fourth year of study or during the summer. Foreign studies options include WSU sponsored programs, and programs offered by other institutions. Coordination is through the Office of International Programs—Global Learning.

Students in the SDC should also expect to participate in a senior portfolio review and/or capstone project presentation prior to graduation. These experiences are unique networking opportunities for graduating students to interact with design and construction professionals, and to receive feedback on their existing portfolios or projects.

A variety of student clubs and organizations provide students with linkages to their professional counterparts. Student organizations with chapters at the SDC include the American Institute of Architecture Students (AIAS); Alpha Rho Chi; American Society of Interior Designers (ASID); American Society of Landscape Architects (ASLA); Associated Students of Construction Management (ASCM); Sigma Lambda Chi; the Design Build Institute of America (DBIA); and Mechanical Contractors Association of America (MCAA).

The SDC also has a student ambassador program where selected students serve as representatives at prospective student events for the University and for the SDC during the fall and spring semesters, and assist with prospective students tours throughout the year.

ARCHITECTURE

The four-year, pre-professional Bachelor of Science in Architectural Studies degree at WSU provides a thorough foundation in the field of architecture as preparation for continued education in a professional degree program; employment in the architecture profession with a licensed architect; and employment options in fields related to architecture.

The Master of Architecture (M.Arch) degree is the professional degree accredited by the National Architectural Accrediting Board (NAAB). Completion of this degree allows students to take state exams and become licensed architects. Students must successfully complete a four-year undergraduate degree in architecture or a previous five-year Bachelor of Architecture degree to be eligible for the one- or two-year M.Arch program. Students with baccalaureate degrees in disciplines other than architecture are eligible to apply for the three-year M.Arch program. Please consult the WSU Graduate Catalog and/or <http://sdc.wsu.edu/> for specific information regarding this degree, as well as admission requirements and course descriptions.

Student Learning Outcomes

Students graduating in architecture are able to: 1) understand the role of architecture within current cultural and global conditions, 2) understand the role of architecture in the enhancement and preservation of natural resources, 3) understand the role of history and its transformations over time, 4) develop a desire and passion for life-long learning, and 5) develop intellectual and analytical skills that will be the foundation for future leaders. It is the intent of the program to graduate future professionals who are committed to excellence in the built environment through the incorporation of intellectual, analytical, and artful aspects of architecture. Within this context, students and faculty seek to investigate issues within diverse contexts in order to creatively advance the built environment.

Transfer Students

Students planning to transfer into the architecture program at Washington State University are subject to the same requirements as all other non-certified students. Transfer students must fulfill all first year course requirements and apply for certification before admittance into the program.

CONSTRUCTION MANAGEMENT

The management of construction projects has become more complex due to the shortage of resources, specialized materials, sophisticated delivery methods and the financial and legal responsibilities encountered during the project life cycle. From construction management to project management and program management, the needs of the industry and the built environment are expanding at an unprecedented rate. At the heart of the building process is the construction professional.

The WSU Construction Management (CM) program provides students with the tools and skills necessary to develop strong administrative, leadership and management expertise to be successful in today's construction industry. Students pursuing a degree in construction management will

be expected to understand a wide variety of topics that make up the built environment. This expertise includes understanding properties of materials and construction systems required for the construction professional. Concepts regarding contract administration, sustainability, risk management, estimating and scheduling are critical skills.

Students in this program are encouraged to develop an inquisitive and inventive mind in order to understand the management techniques, methods and sequencing. It is also important that the graduate in construction management be knowledgeable in the field of business. Courses offered in a variety of departments are required to assure this breadth of understanding. The Bachelor of Science in Construction Management degree program is accredited by the American Council for Construction Education (ACCE).

Student Learning Outcomes

The mission of WSU-CM is to educate, prepare and provide opportunities for students to become valuable resources to our economy, the construction management profession, and the built environment. Student learning outcomes are defined by the following program goals:

- Achieve national and international preeminence in innovation, discovery, and creativity.
- Provide students with the highest quality education that incorporates a holistic awareness of social, political, and global experiences.
- Lead in relevant local, national, and global outreach and engagement.
- Embrace an environment of diversity, integrity, and transparency.

Transfer Students

Students planning to transfer into the construction management program at Washington State University are subject to the same requirements as all other non-certified students. Transfer students must fulfill all first year course requirements and apply for certification before admittance into the program.

INTERIOR DESIGN

Accredited by the Council for Interior Design Accreditation (CIDA), the Bachelor of Arts in Interior Design is a professional degree program that provides the common body of knowledge related to interior design as recognized by CIDA. The interior design program is based on a concern for human beings and the creation of interior settings that support human activities and values. The curriculum is structured to create unique learning experiences each semester. Studios focus on a multitude of design theories rooted in a variety of relevant disciplines. Lecture course content is integrated into the studio experience to reinforce specified skills and knowledge. With increasing challenge and complexity, multidisciplinary exposure and experiences continue throughout the curriculum to inform design solutions as well as prepare students to work with a myriad of professionals upon graduation.

Professional/Global Experience

The WSU Interior Design program values experiential learning as an important component of a student's education. Students are required to participate in two off-campus study tours during

the certified program. All fourth-year students must present their portfolio of creative work at an off-campus review to graduate.

In the fall semester of the fourth year students will participate in a professional and/or global experience, choosing one of the following options:

- Option 1: Internship—students can choose to complete a 5-credit internship and are encouraged to seek opportunities beyond the region.
- Option 2: Study Abroad—students can choose to participate in the department's study abroad program providing them an opportunity to experience design within the context of another culture.
- Option 3: Community Studio—students can work with faculty on community-based projects.

Student Learning Outcomes

A graduate of the interior design program is a creative thinker and problem solver. An education in interior design develops intellectual curiosity, which supports continued professional development throughout life. Students develop skills that allow them to analyze information, evaluate issues, and set priorities while generating creative design solutions for projects of a complex scale. As graduates of WSU's Interior Design program, students have the ability to take the initiative, make critical judgments of their own designs, as well as others, and operate within a team context; all of which contributes to their future success as professionals.

Transfer Students

Students wishing to transfer from another institution into the interior design program beyond the first year, must submit a portfolio and academic transcripts for consideration. Contact the interior design program for portfolio requirements.

Graduate Studies

The Master of Arts in Interior Design (MA) program increases students' understanding of the relationship between human behavior and interior environments through advanced study and hands-on research. Students gain knowledge and skills that prepare them to analyze information and relationships, evaluate issues, and set priorities, while creating functional and high quality design solutions for complex projects. The degree is offered in three tracks depending on prior academic and professional background. Please consult the WSU Graduate catalog and/or <http://sdc.wsu.edu> for specific information regarding this degree, as well as admission requirements and course descriptions.

LANDSCAPE ARCHITECTURE

Landscape architecture involves designing and implementing opportunities for people to engage with their environment. It is an interdisciplinary field dedicated to crafting meaningful places across diverse scales and contexts.

The Bachelor of Landscape Architecture (BLA) is a professional degree program that prepares students to enter and advance the diverse profession of landscape architecture, address complex societal issues, and envision solutions that optimize the physical environments where people work, live, and recreate.

The BLA curriculum is structured to create unique learning experiences each semester. Broadly speaking, the curriculum emphasizes practical

and applied experiential learning, draws from courses across campus, and provides students with opportunities to think critically and integrate diverse bodies of knowledge. The professional course of study is divided into two segments: pre-landscape architecture and the second – fourth year professional landscape architecture program (BLA). Completion of the program leads to the degree of Bachelor of Landscape Architecture and allows the graduate to enter the profession. At least three additional years of professional experience and successful completion of the landscape architectural license examination are necessary for registration as a licensed landscape architect in most states.

The core component of the landscape architecture curriculum is the studio experience. The studios are structured to facilitate understanding of the web of relationships among physical, biological, and social systems. Through the studio curriculum students learn habits of linking ecological processes with space making and necessarily consider interdependence, reciprocity, and change.

First year projects focus on the basic elements and principles of design and design process. The second year emphasizes the concept of site and the methods for and consequences of manipulating the ground and vegetation. Coursework includes site design, site engineering, plant materials, and design history. The third year reinforces and extends students' understanding of the field of landscape architecture and emphasizes integration of theory, practice, and construction. Studios focus on design for communities in the broadest sense. In the fourth year, coursework emphasizes design in the context of landscape complexity, systems thinking, and the overlap of global and local issues. Students develop and execute independent projects. In the projects they are encouraged to think of design as an answer to a question and regard their work as an opportunity to develop, test, and challenge what they have learned in the first three years of their design education. Computer visualization and freehand drawing skills are threaded throughout the curriculum.

WSU landscape architecture students will be required to participate in two off-campus study tours during the certified program. All fourth year students must present their capstone project and a portfolio of creative work at an off-campus review to graduate.

Student Learning Outcomes

Through the program, students learn to understand the complex nature of problems and questions associated with people and landscapes, as well as how to craft and communicate design and planning solutions in response to these problems and questions. Upon completing the degree, graduates can perform as entry level practitioners of landscape architecture. Additionally, they are able to take initiative, make critical judgments of designs, and operate within a team context; all of which contributes to their future success as landscape architectural design professionals.

Transfer Students

Transfer students who have completed the equivalent of the pre-LA curriculum may apply to the professional program by submitting a portfolio and academic transcripts. Contact the landscape architecture program for more information.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

ARCHITECTURE (PRE-PROFESSIONAL PROGRAM) (31 HOURS)

General Requirements - BS in Architectural Studies

1. Due to limitations of space and faculty, enrollment in second-year courses and certification as a major in architecture can be granted to only the most qualified students. Prospective applicants for these programs are responsible for familiarizing themselves with the School of Design and Construction's requirements and procedures.

2. Students who wish to transfer from another institution may find it possible to transfer University Common Requirement (UCORE) course work from these institutions. While this may reduce the amount of time required at WSU to complete UCORE requirements, it is very difficult to transfer appropriate architecture course work to compress the four-year time period. Please consult the WSU Transfer Guide and contact the School of Design and Construction for information regarding transfer requirements.

3. Transfer students and former WSU students must submit an application for admission to the university, a supplemental application, and current academic records to the School by the dates listed in this catalog.

4. Students wishing to transfer from another institution into the second, third, or fourth year of architecture must submit a portfolio in order for the School to evaluate their potential for success in the program. Contact the School for portfolio requirements.

5. A student may not enroll in 300- or 400-level ARCH courses without being certified in architecture.

6. A student may not take courses required by the School on a pass, fail basis.

7. Third-year, fourth-year, and graduate students will be required to participate in one short off-campus study tour each year.

8. All students admitted into the second year will be required to purchase laptop computers. Please contact the School for details and specifications.

Students who enter WSU and have an interest in architecture should contact the academic coordinator for specific advising.

First Year

<i>First Term</i>	<i>Hours</i>
Fine Arts Elective ¹	3
HISTORY 105 [ROOT]	3
Humanities [HUM]	3
SDC 100 [ARTS]	3
SDC 120	3

<i>Second Term</i>	<i>Hours</i>
Diversity [DIVR]	3
ENGLISH 101 [WRTG]	3
MATH 171 [QUAN] ²	4
SDC 140	3
Social Sciences [SSCI]	3

¹ Any FINE ART course.

² Students who are not adequately prepared for MATH 171 should take MATH 106 and 108 as needed during their first year. All freshmen must take the math placement exam.

BACHELOR OF SCIENCE IN ARCHITECTURAL STUDIES (SECOND THROUGH FOURTH YEARS) (120 TOTAL HOURS)

The Bachelor of Science in Architectural Studies is a program primarily for those who want a foundation in the study of architecture. This degree was designed for students who want to pursue a career in architecture or to work in an architecturally related discipline such as planning, technology, project and community development or within government agencies. On successful completion of the B.S. Architectural Studies program, an individual can work as an unlicensed architect in a professional architecture practice. In order to be eligible to license as an architect, a professional Master of Architecture program must also be completed. This degree may also be used as a preparation for professional, accredited graduate education. Students who pursue this option at WSU must complete all university requirements in addition to School requirements listed below.

Pre-Architecture

Students who enter WSU and have an interest in architecture will be assigned an advisor in the School of Design and Construction (SDC). Students interested in architecture should enroll in SDC 100 and 140 fall of their freshman year, as these are the first two prerequisites in an eight-semester sequence.

Certified Program

The SDC accepts 40-45 students into the second year. Students wishing to certify into the Bachelor of Science in Architectural Studies program must apply for certification during the spring semester of their first year in the program. Certification requirements include completion of a minimum of 24 semester hours and earning a C or better grade in the following required courses: SDC 100, 120, and 140. Additional required courses are COM 102, ENGLISH 101, HISTORY 105, MATH 171, and one fine arts class (FINE ART 101, 201, or 202 recommended). Transfer equivalents may be approved by the program. While students must have a minimum cumulative WSU GPA of 2.5 to apply for certification, the process is competitive due to limited space in upper division courses. Students' overall WSU GPA and major specific GPA from the courses listed above are considered.

Transfer Students

Students who wish to transfer into the second year must demonstrate equivalent course work from another institution. Transfer students must make application to Washington State University and the School of Design and Construction. Students will be evaluated based upon grades from coursework that is equivalent to first year requirements at WSU.

Application/Portfolio/Notification Deadlines:

May 1 All second-year applications due.

May 1 Portfolios due from applicants who did not complete SDC 100, 120, and 140 at WSU.

June 1 Screening complete: Applicants will be classified as accepted or denied. Applicants will be notified by mail in June.

NOTE:

Students offered positions in the second-year courses must promptly notify the SDC of their acceptance of the position or the next alternate will be offered the position.

Students that are admitted must be registered for the fall semester and attend the first day of classes or lose their position.

Second Year

<i>First Term</i>	<i>Hours</i>
ARCH 201	4
ARCH 220	3
Creative & Professional Arts [ARTS] ¹	3
PHYSICS 101 [PSCI] or 201 [PSCI]	4
SDC 250 or CST M 202	3

<i>Second Term</i>	<i>Hours</i>
ARCH 203	4
ARCH 209	3
Communication [COMM] or Written Communication [WRTG]	3
Physical Sciences [PSCI] ²	3 or 4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
ARCH 210	3
ARCH 301	5
ARCH 309 [M]	3
ARCH 351	3
CST M 332	3

<i>Second Term</i>	<i>Hours</i>
ARCH 215	3
ARCH 303	5
ARCH 352	3
Biological Sciences [BSCI]	3 or 4
CST M 333	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
ARCH 401	5
ARCH 472	3
ARCH Emphasis Elective ³	3
SDC 350 [M]	3

<i>Second Term</i>	<i>Hours</i>
ARCH 403	5
ARCH Emphasis Electives ³	6
Integrative Capstone [CAPS]	3

¹ FINE ART 101, 201, or 202 recommended.

² At least 3 hours of Physical Science [PSCI] in addition to PHYSICS 101 or 201 are required for graduation.

³ At least 9 hours of any 300-400-level courses from ARCH, I D, and LND ARCH not used to fulfill major requirements.

CONSTRUCTION MANAGEMENT (PRE-PROFESSIONAL PROGRAM) (123 TOTAL HOURS)

Construction management is a four-year program structured into one year of preconstruction management and three years of construction education.

The degree of Bachelor of Science in Construction Management is for those students who wish to work in the profession of construction management or in a management capacity in other facets of the construction industry.

Upon completion of the preconstruction management program requirements, or their equivalent for transfer students, application must be made for certification into the Construction Management program at the end of the first year.

All students admitted into the second year will be required to purchase laptop computers. Please contact the school for details and specifications.

Certification Requirements:

The School of Design and Construction has separate admissions and certification policies and procedures for its different degree programs. Admission to the Construction Management program will be considered for those who have qualified for admission to WSU and fulfill the requirements outlined below.

The undergraduate Construction Management program has a one-step screening process leading to certification. The screening process takes place between the first and second year. Qualified students will be certified at this time and allowed to take upper-level coursework as well as construction management courses. This limitation is imposed because of limited space, equipment and faculty resources. Students may transfer to the school during the two-year process or apply directly for second-year certification.

Application Requirements and Deadlines:

All second-year applications are due by May 1.

Grade records for transfer students for the semester or quarter must be available to the construction management coordinator before June.

The construction management coordinator reviews all applications and makes recommendation to the School of Design and Construction's Admissions and Academic Affairs committee regarding applicants. Selection will be made on or about June 15; all applicants will be notified of their status by letter mailed from the School.

Course and GPA Requirements for Screening:

Because the School receives more applications from qualified students than can be accommodated, screening for entry into the second year is based on the applicant fulfilling the minimum requirements listed and the applicant's overall GPA. To be considered for admission, an applicant must:

- Qualify for admission into Washington State University.
- Complete the first year as listed herein under preconstruction management.
- Earn a grade of C or better in each of the following: COM 102 or H D 205; CST M 102; HISTORY 105; HISTORY 120 or 121, ECONS 101; ECONS 102; ENGLISH 101; GEOLOGY 101; MATH 171; and

another course that meets a University Common Requirement (UCORE) other than those previously listed. For applicant screening, the highest grade will be used.

- Complete and submit an application to the Construction Management program by May 1.
- Maintain an overall minimum GPA of 2.5.

First Year

<i>First Term</i>	<i>Hours</i>
COM 102 [COMM] or H D 205 [COMM]	3 or 4
ECONS 101 [SSCI]	3
GEOLOGY 101 [PSCI]	4
HISTORY 105 [ROOT]	3
SDC 100 [ARTS]	3

<i>Second Term</i>	<i>Hours</i>
CST M 102	2
ECONS 102	3
ENGLISH 101 [WRTG]	3
HISTORY 120 [DIVR] or 121 [HUM]	3
MATH 171 [QUAN]	4

CONSTRUCTION MANAGEMENT (SECOND THROUGH FOURTH YEARS) (92 HOURS)

Second Year

<i>First Term</i>	<i>Hours</i>
ARCH 351	3
B LAW 210	3
CST M 201	3
CST M 254	2
PHYSICS 101 or 201	4

<i>Second Term</i>	<i>Hours</i>
ACCTG 230	3
ARCH 352	3
CST M 202	3
CST M 252	4
Diversity [DIVR] or Humanities [HUM] ¹	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
C E 302	3
CST M 332	3
CST M 368	3
CST M 370	3
CST M 451	3

<i>Second Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab	4
CST M 333	3
CST M 356	3
CST M 362 [M]	3
CST M 371	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
ARCH 463	3
CST M 301 or MGMT 301	3
CST M 460	3
CST M 462	3
300-400-level CST M Elective	3

<i>Second Term</i>	<i>Hours</i>
CST M 473	3
CST M 475 [M]	3

Integrative Capstone [CAPS]	3
300-400-level Business Elective ²	3
300-400-level CST M Elective	3

¹ University Requirements include 3 hours of [HUM] and 3 hours of [DIVR].

² ECONS 327, WOMEN ST 315, or any 300-400-level ACCTG, B LAW, ENTRP, FIN, HBM, I BUS, MGMT, MGTOP, MIS, or MKTG course not used to fulfill other requirements.

INTERIOR DESIGN (120 HOURS)

The interior design program offers a balanced exposure to art, architecture, and humanities. All studio projects are informed by relevant theoretical frameworks in order to advance design solutions. Students are required to complete one of three options during the fall of the fourth year: internship, study abroad, or community studio. Second and third-year students will be required to participate in an off-campus study tour during the fall semester.

Students must earn a C or better grade in all courses required for the degree of Bachelor of Arts in Interior Design. At the end of their program of study, all students must submit a digital portfolio of creative work and present their portfolio at an off-campus, program-organized review to graduate.

Certification Requirements

Students must submit a certification application in the spring semester of their first year. Application forms and instructions are available in the School of Design and Construction main office and on the school web site: <http://sdc.wsu.edu>. Due to limitations of space, faculty, and budget, admission is limited and based on academic performance.

Certification requirements include completion of at least 24 semester hours and the following pre-certified I D curriculum. The following three courses (or approved equivalents) must be completed with a grade of C or better: SDC 100, SDC 120, and SDC 140. Additional required courses are HISTORY 105, MATH 105 (or higher), ENGLISH 101, COM 102 or H D 205, and one fine arts class (FINE ART 101, 201, or 202). A minimum 2.5 WSU cumulative GPA is required to apply for certification. Students' overall WSU GPA and major specific GPA from the courses listed above are considered in the application process.

Students wishing to transfer from another institution into the second, third, or fourth year of interior design must submit a portfolio and academic transcripts for consideration. Contact the interior design program for portfolio requirements or visit <http://sdc.wsu.edu/interior-design/student-resources/advising/>.

All students admitted into the second year will be required to purchase laptop computers. Details and specifications can be found on the school website: <http://sdc.wsu.edu>.

First Year

<i>First Term</i>	<i>Hours</i>
HISTORY 105 [ROOT]	3
[QUAN] Course	3
SDC 100	3
SDC 120	3
Social Sciences [SSCI] ¹	3

<i>Second Term</i>	<i>Hours</i>
COM 102 [COMM] or H D 205 [COMM]	3
Creative & Professional Arts [ARTS] ²	3
ENGLISH 101 [WRTG]	3
Humanities [HUM]	3
SDC 140	3
Apply for Certification	

Second Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] or SCIENCE 101 [SCI] ³	3
I D 197	3
I D 201	4
I D 205	3
I D 277	1
SDC 250	3
<i>Second Term</i>	<i>Hours</i>
I D 203	4
I D 215	3
I D 297	3
Physical Sciences [PSCI] or SCIENCE 102 [SCI] ³	4
SDC 350 [M]	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
ARCH 472	3
DESIGN 397	3
I D 321	4
I D 325	3
SDC 444	1
<i>Second Term</i>	<i>Hours</i>
Diversity [DIVR]	3
I D 333	4
I D 392 [M]	3
I D 415	3
Supportive Electives ⁴	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
I D 425 or 490	5
Supportive Electives ⁴	9
<i>Second Term</i>	<i>Hours</i>
I D 426	5
I D 460	3
Integrative Capstone [CAPS]	3
Elective	1
Portfolio Review	

¹ SOC 101 or PSYCH 105 is suggested.² Choose one: FINE ART 101, 201 or 202.³ For a total of 7 credits—one Biological Science [BSCI] and one Physical Science [PSCI] course, including one lab course, or 8 credits of [SCI] designated courses. (SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI], which is offered Spring semester.)⁴ Supportive electives as listed or approved by faculty advisor; transfer interior design hours as approved by the department: FINE ART 201, 202 (if not used as a certification course); SOC 343, 350, 351; I D 278, 279, 305, 490 (if not used to fulfill a requirement in program of study), 498; upper division ARCH, LND ARCH, and CST M courses.**LANDSCAPE ARCHITECTURE
(120 HOURS)**

Accredited by the Landscape Architectural Accreditation Board (LAAB), the Bachelor of Landscape Architecture (BLA) is a professional degree program that provides students with the common body of knowledge related to landscape architecture. The Landscape Architecture Program is based on a concern for human beings and the environment. The program teaches students to create outdoor spaces that support human activities and that positively affect the environment.

The BLA curriculum is structured to create unique learning experiences each semester. Broadly speaking, the curriculum emphasizes practical and applied experiential learning, draws from courses across campus, and provides students with opportunities to think critically and integrate diverse bodies of knowledge.

The professional course of study is divided into two segments: pre-landscape architecture and the second – fourth year professional landscape architecture program (BLA). Completion of the program leads to the degree of Bachelor of Landscape Architecture and allows the graduate to enter the profession. At least three additional years of professional experience and successful completion of the landscape architectural license examination are necessary for registration as a licensed landscape architect in most states.

Pre-landscape architecture (pre-LA) is a one-year, non-degree course of study that is intended to prepare undergraduate students for the advanced professional curriculum. The pre-LA curriculum concentrates on University Common Requirements (UCORE) and basic professional courses. UCORE courses should be selected with the assistance of a landscape architecture advisor. Transfer students who have not completed the equivalent of the pre-LA course work will be accepted directly into pre-LA.

Certification Requirements

Students must submit a certification application in the spring semester of their first year. Application forms and instructions are available in the School of Design and Construction main office and on the web site: <http://sdc.wsu.edu>. Due to limitations of space, faculty, and budget, admission is limited and based on academic performance.

Certification requirements include completion of at least 24 semester hours and the pre-LA curriculum. The following three courses (or approved equivalents) must be completed with a grade of C or better: SDC 100, SDC 120 and SDC 140. Additional required courses are HISTORY 105, ENGLISH 101, MATH 105 (or higher), COM 102 or H D 205, and one fine arts course (FINE ART 101, 201, or 202). A minimum 2.5 WSU cumulative GPA is required to apply for certification. Students' overall WSU GPA and major specific GPA from the courses listed above are considered in the application process.

Professional Program Requirements (BLA)

Students must earn a C or better grade in all courses required for the landscape architecture professional program. To graduate, at the end of their program of study, all students must submit a digital portfolio of creative works and present their portfolio at an off-campus, program-organized review. Students will

be required to participate in two off-campus study tours, designated by the program, one in the fall semester of the second year, and one in the spring semester of the fourth year.

Transfer students who have completed the equivalent of the pre-LA curriculum may apply to the professional program by submitting a portfolio and academic transcripts for consideration. Contact the landscape architecture program for portfolio requirements.

All students admitted into the second year will be required to purchase a laptop computer. Details and specifications can be found on the school website: <http://sdc.wsu.edu>.

First Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 120 [BSCI] ¹	4
HISTORY 105 [ROOT]	3
MATH 105 or higher [QUAN]	3
SDC 100	3
SDC 120	3

<i>Second Term</i>	<i>Hours</i>
COM 102 [COMM] or H D 205 [COMM]	3
Creative & Professional Arts [ARTS] ²	3
ENGLISH 101 [WRTG]	3
GEOLOGY 101 [PSCI]	4
SDC 140	3
Apply for Certification	

Second Year

<i>First Term</i>	<i>Hours</i>
HORT 330	3
LND ARCH 102	3
LND ARCH 222	1
LND ARCH 262	3
SDC 250	3
Social Sciences [SSCI]	3

<i>Second Term</i>	<i>Hours</i>
Humanities [HUM]	3
LND ARCH 263	3
LND ARCH 365	4
SDC 350 [M]	3
SOIL SCI 201	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
LND ARCH 327	3
LND ARCH 362	4
LND ARCH 366	4
LND ARCH 467	4
LND ARCH 499	1

<i>Second Term</i>	<i>Hours</i>
Diversity [DIVR]	3
HORT 331	3
LND ARCH 363	4
LND ARCH 367	3
LND ARCH 380 ³	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
LND ARCH 470	4
Electives	8

<i>Second Term</i>	<i>Hours</i>
LND ARCH 450 [M]	3
LND ARCH 480	2

LND ARCH 485 [CAPS] [M]	4
Electives	3
Complete Digital Portfolio	

¹ If BIOLOGY 120 is not taken in Fall, BIOLOGY 106 can be substituted in the Spring.

² Choose one: FINE ART 101, 201 or 202.

³ If LND ARCH 380 is not available, may use BIOLOGY 372, 462, NATRS 300, 454, or 464.

Minors

Architectural Studies

The minor in architectural studies requires a minimum of 18 hours of which at least 9 must be upper-division and taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. To be eligible to apply for the minor a student must have ARCH 101 and minimum GPA of 2.50. The minor is limited to 10 students per year. The required courses are ARCH 103, 209, 309, 201 or 324, and 6 hours of upper-division architectural emphasis coursework.

Construction Management

The minor in construction management requires a minimum of 17 hours, 9 of which must be upper-division and taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. To be eligible to apply for the minor a student must have ARCH 101 or approved drawing course, certification in any major, and minimum GPA of 2.70. The minor is limited to 10 students per year. The required courses are CST M 102, 252, 370, 462 and 6 hours of business or construction emphasis electives. One business elective may be 200-level. Construction emphasis electives must be upper-division.

Description of Courses

ARCHITECTURE

ARCH

- 201 Architectural Design I** 4 (0-8) Course Prerequisite: Certified major in Architectural Studies. Introduction to architectural design focusing on composition, conceptual design and principles of organization, scale, proportion, rhythm and 3-D development.
- 203 Architectural Design II** 4 (0-8) Course Prerequisite: ARCH 201. Introduction to architectural design focusing on the art and aesthetics of structural expression and principles of structure as an ordering system.
- 209 Design Theory I** 3 Course Prerequisite: Certified Architecture major; concurrent enrollment in ARCH 203. Design theory relating to building technology, systems and crafts which influence design decisions.
- 210 Digital Analysis and Representation** 3 (2-3) Course Prerequisite: Certified major in Architectural Studies. Introduction to analysis and representation with a focus on the use of digital tools.

215 Issues in Sustainable Architecture 3 Course Prerequisite: Certified major in Architectural Studies. Introduction to analysis and representation with a focus on the use of digital tools.

220 Architectural History I 3 Course Prerequisite: Certified major in Architecture with concurrent enrollment in ARCH 201, or certified majors pursuing non-Architecture degrees. Historic development of world architecture from prehistory to late medieval; social, technical and scientific influences.

301 Architectural Design III 5 (0-10) Course Prerequisite: Certified major in Architecture; ARCH 203. Introduction of architectural design focusing on environmental and social issues. Travel for site visit required.

303 Architectural Design IV 5 (0-10) Course Prerequisite: Certified major in Architecture; ARCH 301. Continuation of study of architectural design/form as influenced by cultural, spiritual and symbolic issues. Travel for site visit required.

309 [M] Modern Architecture and Theory 3 Course Prerequisite: SDC 250; SDC 350; concurrent enrollment in ARCH 301; certified major in Architecture. Built and theoretical developments in architecture from the nineteenth century to present; content may be linked to study tour.

351 Architectural Structures I 3 Course Prerequisite: Certified major in Architecture or Construction Management. Introduction to statics and mechanics; analysis and design of statically determinate architectural structures using timber, steel, and reinforced concrete systems.

352 Architectural Structures II 3 Course Prerequisite: Certified major in Architecture or Construction Management; ARCH 351. Continuation of ARCH 351.

401 Architectural Design V 5 (0-10) Course Prerequisite: Certified major in Architecture; ARCH 303. Advanced architectural design focusing on technology, systems and crafts of buildings. Travel for site visit required.

403 [CAPS] Comprehensive Design Studio I 5 (0-10) Course Prerequisite: ARCH 401; certified major in Architecture; senior standing. Advanced study of architectural design/form as influenced by social and environmental issues applied to large-scale developments. Travel for site visit required.

409 [M] Design Theory VI 3 Course Prerequisite: Certified major in Architectural Studies. Advanced design theory relating to social and environmental issues which influence housing design for the urban environment.

428 Architecture and Culture in the Islamic World 3 Course Prerequisite: Junior standing. A thematic course exploring the relationship between architecture and culture in the context of Islamic civilization.

436 Contemporary Furniture Design 3 (1-4) Course Prerequisite: ARCH 203 with a C or better, I D 203 with a C or better, LND ARCH 263 with a C or better, or graduate student. Investigation of issues related to the design and fabrication of furniture; students design and fabricate projects in the school shop.

440 Architectural Acoustics for Construction Management 2 Introduction to the art and science of architectural acoustics with emphasis on understanding construction performance specifications. (Crosslisted course offered as ARCH 440, CST M 440).

446 Computer Animation I 3 (1-4) Introduction to computer animation production and building simulation; applicable for all majors.

451 Computer-aided Design I 3 (2-2) Course Prerequisite: Certified major in Architecture or Construction Management. Computer-aided design related to 3D modeling and construction documents.

452 Computer-aided Design II 2 (1-2) Course Prerequisite: Certified major in Architecture or Construction Management. Continuation of ARCH 451. Computer-aided design related to 3D modeling and construction documents.

456 Field Sketching/Journal Keeping 3 (2-2) Certified major in Architecture, Interior Design, Landscape Architecture, or Construction Management. Field-sketching/journal-keeping strategies to facilitate investigation and comprehension of the built environment.

463 Architectural Structures III 3 Course Prerequisite: Certified major in Architecture or Construction Management; ARCH 352. Wind and seismic loads on architectural structures; high-rise systems; reinforced concrete and masonry structures. Credit not granted for both ARCH 463 and ARCH 563.

464 Architectural Structures IV 3 Course Prerequisite: Certified major in Architecture or Construction Management; ARCH 352. Deflection theory; classical and computer analysis for statically indeterminate architectural structure systems. Credit not granted for both ARCH 464 and ARCH 564.

472 Codes and Acoustics 3 Course Prerequisite: Certified major in Architecture or Construction Management. Building codes and specifications; sound theory, control, and acoustic systems applied to buildings.

480 Architecture Internship V 1-16 May be repeated for credit; cumulative maximum 16 hours. Course Prerequisite: Certified major in Architecture or Construction Management. Placement in an approved industrial, professional, or governmental situation for specialized or general experience.

490 Seminar in Architectural Design V 1-4 May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: ARCH 203 with a C or better, I D 203 with a C or better, LND ARCH 263 with a C or better, or graduate student. Advanced study in architectural design. Cooperative: Open to UI degree-seeking students.

- 491 Seminar in Architectural Communications V** 1-4 May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: ARCH 203 with a C or better, I D 203 with a C or better, LND ARCH 263 with a C or better, or graduate student. Advanced study in graphic communication.
- 492 Seminar in Architectural History V** 1-4 May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: ARCH 203 with a C or better, I D 203 with a C or better, LND ARCH 263 with a C or better, or graduate student. Advanced study in architectural history.
- 493 Seminar in Environmental Control V** 1-4 May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: ARCH 203 with a C or better, I D 203 with a C or better, LND ARCH 263 with a C or better, or graduate student. Advanced study in environmental control of buildings.
- 494 Seminar in Urban and Regional Planning V** 1-4 May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: ARCH 203 with a C or better, I D 203 with a C or better, LND ARCH 263 with a C or better, or graduate student. Advanced study in urban and regional planning.
- 495 Seminar in Construction Management V** 1-4 May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: Certified major in Architectural Studies. Advanced study in construction practice management.
- 496 Seminar in Computer Applications V** 1-4 May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: ARCH 203 with a C or better, I D 203 with a C or better, LND ARCH 263 with a C or better, or graduate student. Architectural and construction applications of computer graphics, management, computer-aided design.
- 499 Special Problems V** 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 510 Summer Graduate Design Studio 6** (0-12) Intensive summer studio focusing on design projects that address prevailing issues in a particular context and locale (regional, national, or international city) outside of Pullman.
- 511 Graduate Design Studio I 6** (0-12) Graduate studio experience researching a single topic of architectural relevance. Travel for site visit required.
- 513 Graduate Design Studio II 6** (0-12) Course Prerequisite: ARCH 511 with a C or better. Graduate studio experience researching a single topic of architectural relevance. Travel for site visit required.
- 515 Research Methods and Programming 3** Exploration of traditional research methods and investigations for architects.
- 520 Directed Topics in Architecture V** 1-3 May be repeated for credit; cumulative maximum 6 hours. Topics related to areas of emphasis in the program and student specialization.
- 525 History and Theory 3** History and theory of 20th century architecture focusing on cultural and philosophical principles related to design.
- 527 Site and Landscape Design 3** Exploration of issues of site context analysis, topography, planning, and landscape design.
- 530 Philosophies and Theories of the Built Environment 3** Course Prerequisite: Graduate standing in Architecture, Interior Design, or Landscape Architecture. Focus on systematic thought which may describe behavior of the built environment. (Crosslisted course offered as ARCH 530, I D 530, LND ARCH 530).
- 531 Advanced Tectonics 3** Tectonic theory of concrete and metal construction with focus on skin design and technology as formative elements in architecture.
- 540 Research Methods 3** Research methods, from quantitative to technical to philosophical, directed toward qualitative research. (Crosslisted course offered as ARCH 540, I D 540, LND ARCH 540).
- 542 Issues in Architecture 3** Examination of issues in architecture related to society, culture, environment, politics, and philosophy.
- 560 Interdisciplinary Seminar 3** Explores approaches to design thinking in the topic areas of people and place, history, theory and criticism, and physical design. (Crosslisted course offered as ARCH 560, I D 560, LND ARCH 560).
- 563 Architectural Structures III 3** Wind and seismic loads on architectural structures; high-rise systems; reinforced concrete and masonry structures. Credit not granted for both ARCH 463 and ARCH 563.
- 564 Architectural Structures IV 3** Course Prerequisite: ARCH 511 or concurrent enrollment. Deflection theory; classical and computer analysis for statically indeterminate architectural structure systems. Credit not granted for both ARCH 464 and ARCH 564.
- 570 Advanced Architectural Design Studio I 6** (0-12) Advanced study of design problems relating to culture, environment, technology, urban planning, or other topics. Travel for site visit required.
- 571 Advanced Architectural Design Studio II 6** (0-12) Course Prerequisite: ARCH 570. Advanced study of design problems relating to culture, environment, technology, urban planning, or other topics. Travel for site visit required.
- 573 Ethics and Practice 3** Ethical and professional practice issues related to the business and practice of architecture; investigations into marketing client and business orientation.
- 577 Theories and Methods of Urban Construction 3** Morphology, theoretical concepts, planning and spatial structure of cities and analysis of the transformation of the city core in Europe and America.
- 580 Architecture Practicum V** 1-4 May be repeated for credit. Course Prerequisite: Graduate student in M Architecture degree program. Internship, travel study, or independent study related to the field of architecture.
- 600 Special Projects or Independent Study V** 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination. V** 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 702 Master's Special Problems, Directed Study, and/or Examination V** 1-6 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

CONSTRUCTION MANAGEMENT

CST M

- 102 Introduction to the Built Environment 2** Introduction to the construction industry; reviewing contract documents, methods of project management and current issues pertaining to the industry.
- 201 Materials I 3** Course Prerequisite: Certified major in Construction Management or Architecture. Introduction to construction materials; primary materials used in below-grade substructures and above-grade superstructures using Construction Specification Institute (CSI) format.
- 202 Materials II 3** Course Prerequisite: CST M 201; certified major in Construction Management or Architecture. Introduction to primary materials in construction of building envelopes, interiors, interior surfaces and finishes using Construction Specification Institute (CSI) format.
- 252 Construction Administration and Documentation 4** (3-2) Course Prerequisite: CST M 102; CST M 201; certified major in Construction Management. Study and understanding of administrative procedures found within construction projects and respective documentation.

- 254 Construction Graphics 2** (1-2) Course Prerequisite: Certified major in Construction Management or Civil Engineering. Visual literacy and details in construction documents using drawing techniques.
- 301 Management and Organization 3** Course Prerequisite: Certified major in Construction Management. Principles of management, administration, and organization with an emphasis on their relationship to the construction management profession.
- 332 Building Science I 3** Course Prerequisite: Certified major in Architecture or Construction Management. Mechanical systems for buildings; building heating, ventilating, and air conditioning systems, heat flow concepts.
- 333 Building Science II 3** Course Prerequisite: CST M 332; certified major in Architecture or Construction Management. Water supply, drainage, electrical and lighting systems for buildings.
- 356 Earthwork and Equipment 3** Course Prerequisite: CE 322; certified major in Construction Management or Civil Engineering. Methods and procedures for site work, excavation, dewatering, building foundation and equipment, productivity, finance and safety requirements.
- 362 [M] Legal Aspects of Construction and Design 3** Course Prerequisite: CST M 252; B LAW 210; certified major in Construction Management. Statutory and common law governing the practice of design and construction in the US; emphasis in architecture and construction project contract administration.
- 368 Safety and Health 3** Course Prerequisite: Certified major in Construction Management; junior standing. Role and function of safety and health in the construction industry including OSHA compliance, requirements and regulations.
- 370 Estimating I 3** (2-1) Course Prerequisite: CST M 252; certified major in Construction Management. Certified civil engineering majors may take by permission. Applications of quantity survey, techniques in creation of unit costs, introduction of job expenses and bid presentation.
- 371 Estimating II 3** (2-3) Course Prerequisite: CST M 370; certified major in Construction Management. Bidding application, advance concepts in the creation of imot cpst and computer software applications.
- 440 Architectural Acoustics for Construction Management 2** Introduction to the art and science of architectural acoustics with emphasis on understanding construction performance specifications. (Crosslisted course offered as ARCH 440, CST M 440).
- 451 Delivery Systems 3** Course Prerequisite: CST M 252; certified major in Construction Management or junior status in Architecture, Interior Design, Landscape Architecture, or Civil Engineering. Design/construction process and project delivery systems/approaches; analysis of construction management; the construction management process.
- 458 Methods and Procedures of Heavy Construction 3** Course Prerequisite: Certified major in Construction Management; junior standing. Methods and procedures for site work, heavy equipment, cranes, productivity; finance and safety requirements.
- 460 Construction Cost Accounting 3** (2-3) Course Prerequisite: CST M 371; certified major in Construction Management. Examination of cost accounting utilized for specific project control as well as overall company control.
- 462 Planning and Scheduling 3** (2-3) Course Prerequisite: CST M 371, or CE 322 and 317; certified major in Construction Management or Civil Engineering. Methods, principles, and concepts required to plan and schedule construction projects; introduction to scheduling software.
- 466 Heavy/Civil Estimating 3** Course Prerequisite: Certified major in Construction Management, or junior standing and certified major in Civil Engineering. Estimating in quantity survey, price extension and bidding in civil projects.
- 467 Ethics and Construction Management 3** Course Prerequisite: CST M 252; CST M 370; senior standing; certified major in Construction Management. Ethics and morality relating to the construction profession including common decisions.
- 469 Residential Green Building 3** Course Prerequisite: Certified major in Construction Management; senior standing. Residential construction segments; sustainable products and practices applicable to residential construction.
- 473 Human Productivity in Construction 3** Course Prerequisite: CST M 301 or MGMT 301; certified major in Construction Management. Leadership and management concepts and methods applied to human behavior to enhance motivation, productivity and safety in construction.
- 475 [M] Senior Capstone Project 3** (2-3) Course Prerequisite: CST M 451; CST M 462; certified major in Construction Management. Simulation of real world competition for Design-Build and/or CM at Risk projects; equipment, productivity, safety requirements, and finance.
- 482 Conceptual Estimating for Architects 3** Course Prerequisite: Certified major in Architecture or Construction Management; junior standing. Quantity survey, price extension and bidding as applied to architecture; concepts of pricing, value engineering, and ethics.
- 495 Seminar in Construction Management V** 1-4 May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: Certified major in Construction Management. Advanced study in construction practice management. May be repeated for credit; cumulative maximum 4 hours.
- 499 Special Problems V** 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.

DESIGN

DESIGN

- 396 Introduction to Digital Modeling 3** Course Prerequisite: Certified major in Interior Design. Computer-aided drafting (CAD) fundamentals and basic theoretical concepts related to its use in professional design practice.
- 497 3-D Digital Modeling and Project Information Management II 3** Integration of advanced building information modeling (BIM) techniques utilizing complex applications within the Revit software suite. Recommended preparation: DESIGN 397.
- 498 Advanced Digital Modeling 3** Broad integration of Non-Uniform Rational B-spline (NURBS) modeling techniques including practical fundamentals and theoretical concepts of modeling, rendering and animation. Recommended preparation: DESIGN 497.
- 550 Applications: Using Research in the Inquiry Process 3** Application of scientific research in the advanced design process.
- 561 Seminar in Design Thinking 3** Course Prerequisite: Doctoral standing in Design. Understanding design thinking or design knowing and translating research and theory into practice.
- 562 Area Readings 3** Course Prerequisite: DESIGN 561. Forum for the advancement of understanding and discussion of readings related to interdisciplinary design.
- 563 Directed Readings 3** Course Prerequisite: DESIGN 562. Advanced critical and comprehensive reviews of literature pertinent to student's focus area; development of specialization and expertise in identified area.
- 564 Design Research Methods 4** Course Prerequisite: DESIGN 562. Development and preparation of research proposals; identification of theories, exploration of research methods and strategies; development of thesis statement and literature review. Recommended preparation: Concurrent enrollment in DESIGN 563; DESIGN 565.
- 590 Teaching Practicum V** 1-3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Doctoral standing in Design. Supervised teaching experience integrating application of design knowledge and approaches. S, F grading.

- 598 Topics in Design V** 1-3 May be repeated for credit; cumulative maximum 9 hours. Course Prerequisite: Doctoral standing in Design. Topical issues in design responding to the shifting demands and needs of the design professions.
- 600 Special Projects or Independent Study V** 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 800 Doctoral Research, Dissertation, and/or Examination V** 1-18 May be repeated for credit. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.
- ## INTERIOR DESIGN
- ### I D
- 101 Design Issues** 3 Sensory awareness as a design determinant; introduction to basic design elements in problem identification and solving processes. Credit not granted for both I D 101 and SDC 100.
- 102 Interior Design Studio I** 3 (0-6) Course Prerequisite: I D 101. Interior design problem-solving grounded in aesthetic theories.
- 103 Transfer Studio** 6 (3-6) An intensive studio introducing basic elements and principles of design; basic technical skills (drafting, sketching, rendering, model building).
- 197 Design Communication I** 3 (2-2) Course Prerequisite: Certified major in Interior Design. Beginning design communication skills, including manual and digital methods. Recommended preparation: I D 101.
- 201 Interior Design Studio II** 4 (1-9) Course Prerequisite: Certified major in Interior Design. Interior design problem-solving grounded in theories of human behavior.
- 203 Interior Design Studio III** 4 (1-9) Course Prerequisite: I D 201. Interior design problem-solving grounded in theories of spatial organization.
- 205 Visual Communication** 3 (2-2) Course Prerequisite: Certified major in Interior Design. Course focuses on the various methods in which the interior designer may choose to visually communicate design concepts.
- 215 Materials and Components of Interior Design** 3 Course Prerequisite: Certified major in Interior Design. Characteristics and properties of structural and non-structural interior materials.
- 250 History of Interiors** 3 A survey of interior environments, spatial distributions, furnishings, and related design elements from ancient Egypt to the 18th century.
- 277 Interior Design Study Tour I** 1 May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: Concurrent enrollment in I D 201. Selected issues in the field of interior design in connection with an organized field trip.
- 278 Special Topics V** 1-3 May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 279 Special Topics: Study Abroad V** 1-15 May be repeated for credit. S, F grading.
- 297 Design Communication II** 3 (2-2) Course Prerequisite: I D 201. Manual and digital design communication skills for 2D/3D design problem solving; integration of current technology and software applications.
- 303 Immersion Studio** 6 (1-10) Course Prerequisite: By permission only. Intense and concentrated experience in design of interior spaces from abstraction and concept to complex interiors of larger scale.
- 305 Freehand Sketching** 3 (2-2) Development of knowledge and skills in freehand sketching to facilitate design exploration and further understanding of the built environment.
- 312 [M] Interior Design Theory** 2 Theory, principles, and determinants of interior design applied to current practice.
- 321 Interior Design Studio IV** 4 (1-9) Course Prerequisite: I D 203. Interior design problem-solving grounded in place theories.
- 325 Interior Building Systems** 3 Course Prerequisite: Certified major in Interior Design. Analysis, planning, and application of interior lighting; introduction to HVAC and plumbing systems.
- 326 Codes for Interior Designers** 3 Course Prerequisite: Certified major in Interior Design. Codes and specifications related to the design of the interior environment, including fire protection standards, accessibility, universal design and acoustics.
- 333 Interior Design Studio V** 4 (1-9) Course Prerequisite: I D 321; DESIGN 397. Interior design problem-solving grounded in organizational theories.
- 350 [M] History of Interiors II** 3 A survey of interior environments, spatial distributions, furnishings, and related design elements in the 19th and 20th centuries.
- 392 [M] Professional Procedures** 3 Course Prerequisite: Certified major in Interior Design. Business practices and procedures as related to interior design; contract documentation and specification writing.
- 397 (DESIGN) Design Communication III** 3 (2-2) Course Prerequisite: Certified major in Interior Design. 3-D digital modeling as a medium to support design visualization, investigation and communication including project information management; emphasis on Revit suite software. Recommended preparation: ID 297 or graduate standing.
- 415 Advanced Interior Construction and Detailing** 3 Course Prerequisite: Certified major in Interior Design. Analysis of building construction and detailing which impacts interior space design.
- 425 Interior Design Studio VI** 5 (0-10) Course Prerequisite: I D 333 or graduate standing in Interior Design. Interior design problem-solving integrating multidisciplinary theories within a community and/or global context.
- 426 [CAPS] Interior Design Studio VII** 5 (0-10) Course Prerequisite: I D 425, certified major in Interior Design, and junior standing; or graduate standing in Interior Design. Comprehensive studio project that integrates and extends interior design skills; entails research, interpretation, writing, graphic communication, design, and oral presentations.
- 460 Portfolio and Representation** 3 Course Prerequisite: Certified major in Interior Design, Landscape Architecture, Architecture, or Construction Management. Develop communication skills and produce documents necessary to professionally present oneself to prospective employers within the fields of design.
- 477 Interior Design Study Tour II** 1 May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: Certified major in Interior Design. Selected issues in the field of interior design in connection with an organized field trip.
- 490 Cooperative Education Internship V** 1 (0-3) to 12 (0-36) May be repeated for credit; cumulative maximum 12 hours. Off-campus cooperative education internship with business, industry, or government unit.
- 498 Special Topics in Interior Design V** 1-3 May be repeated for credit; cumulative maximum 6 hours.
- 520 Historical Perspectives of Interior Space** 3 Historical perspectives of interior environments, spatial distributions, furnishings, and related design elements from ancient Egypt to the 18th century.
- 525 Interior Design Graduate Studio I** 5 (0-10) Graduate studio: application of advanced design theories, philosophies and research methodologies to enhance undergraduate design foundations through interdisciplinary studio experiences.
- 526 Interior Design Graduate Studio II** 5 (0-10) Graduate studio: individual thesis topics and the application of advanced design theories, philosophies, and research methodologies to student's focus topic.
- 530 Philosophies and Theories of the Built Environment** 3 Course Prerequisite: Graduate standing in Architecture, Interior Design, or Landscape Architecture. Focus on systematic thought which may describe behavior of the built environment. (Crosslisted course offered as ARCH 530, I D 530, LND ARCH 530).

- 540 Research Methods 3** Research methods, from quantitative to technical to philosophical, directed toward qualitative research. (Crosslisted course offered as ARCH 540, I D 540, LND ARCH 540).
- 560 Interdisciplinary Seminar 3** Explores approaches to design thinking in the topic areas of people and place, history, theory and criticism, and physical design. (Crosslisted course offered as ARCH 560, I D 560, LND ARCH 560).
- 594 Readings in Interior Design 3** Exploration of current topics through readings in interior design.
- 598 Topics in Interior Design V 1-3** May be repeated for credit; cumulative maximum 6 hours.
- 600 Special Projects or Independent Study V 1-18** May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination V 1-18** May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 702 Master's Special Problems, Directed Study and/or Examination V 1-18** May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.
- LANDSCAPE ARCHITECTURE**
- LND ARCH**
- 101 Landscape Architecture Graphics 3 (1-6)** Basic mechanical and freehand drawing; use of various drafting media, two- and three-D drawing, lettering, and rendering techniques.
- 102 Introduction to Computer Graphics in Landscape Architecture 3 (2-3)** Use of digital media applied to analysis, drafting and rendering skills; introduction to Photoshop, AutoCAD, and Illustrator.
- 222 Landscape Architecture Field Experience I 1 (0-2)** May be repeated for credit; cumulative maximum 2 hours. Field study of landscapes, designers and design firms through travel experiences. Recommended preparation: Sophomore standing and concurrent enrollment in LND ARCH 262.
- 260 History of Landscape Architecture 3 (2-2)** Historical development in the practice and profession of landscape architecture throughout the world, circa BC to present. Cooperative: Open to UI degree-seeking students.
- 262 Landscape Architectural Design I 3 (2-3)** Course Prerequisite: Certified major in Landscape Architecture or Landscape Design and Implementation. Basic design principles and design processes at local regional scales; integration of design graphics and verbal/visual presentations. Field trip required.
- 263 Landscape Architectural Design II 3 (0-6)** Course Prerequisite: LND ARCH 262. Basic design and graphic techniques related to solving of elementary design problems.
- 297 Digital Design Communication 3** Course Prerequisite: LND ARCH 102 or 262. Digital design communication skills for 2D/3D design problem solving; integration of current technology and software applications.
- 327 Theory in Landscape Architecture 3** Course Prerequisite: Junior standing. Theories and frameworks that inform and emerge from the practices and outcomes of landscape architecture.
- 333 Landscape Architecture Field Experience II 1 (0-2)** May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: Certified major in Landscape Architecture or junior standing. Field study of landscapes, designers and design firms through travel experiences.
- 362 Landscape Architectural Design III 4 (2-6)** Course Prerequisite: LND ARCH 263. Professional site design processes; concentration on planting and site planning, design with urban community, ecological, and open-space projects.
- 363 Landscape Architectural Design IV 4 (2-6)** Course Prerequisite: LND ARCH 362. Professional site design processes; concentration on recreation facilities and site planning within residential, urban, institutional, and regional projects.
- 365 Landscape Architectural Construction I 4 (2-6)** Course Prerequisite: Sophomore standing. Basic site planning and construction operations, including grading, drainage, storm water management, and construction document techniques.
- 366 Landscape Architectural Construction II 4 (2-6)** Course Prerequisite: LND ARCH 365. Construction materials and methods, specifications, cost estimating, and construction document preparation.
- 367 Landscape Architectural Construction III 3 (2-3)** Course Prerequisite: LND ARCH 366. Supplemental projects in cost estimating, specifications, construction detailing, and landscape architectural design/build.
- 380 Ecological Applications in Design 3 (2-3)** Course Prerequisite: Junior standing. Fundamental concepts of ecology as a philosophy and a science; emphasis on community, landscape restoration, and historical ecology as they relate to design. Field trip required.
- 399 Professional Work Experience: Office Practice V 1-2** May be repeated for credit; cumulative maximum 4 hours. Planned professional work experience in design and office practice as approved by faculty; written report and presentation to faculty required. S, F grading.
- 450 [M] Principles and Practice of Planning 3** Course Prerequisite: Junior standing. History, theory, methods, and processes in regional planning; contemporary issues and professional practice.
- 467 Regional Landscape Inventory and Analysis 4 (2-6)** Course Prerequisite: GEOLOGY 101 or SOIL SCI 201. Application of ecological planning process for landscape inventory and analysis.
- 470 Landscape Architectural Design V 4 (1-9)** Course Prerequisite: LND ARCH 363. Advanced group and individual landscape architectural design and planning projects; professional applications of site design theory and design processes.
- 475 Senior Project Proposal 2** Course Prerequisite: LND ARCH 363. Program planning for senior project. S, F grading.
- 477 Landscape Applications of Geographic Information Systems 3 (1-6)** Course Prerequisite: LND ARCH 467. GIS-based spatial data development and analysis skills in an applied, real-world context.
- 480 Professional Practice 2** Course Prerequisite: LND ARCH 363. Current office practices, design and construction management techniques; introduction to construction contract legal requirements within the practice of landscape architecture. Cooperative: Open to UI degree-seeking students.
- 485 [CAPS] [M] Senior Comprehensive Project 4 (0-8)** Course Prerequisite: LND ARCH 363; certified major in Landscape Architecture; senior standing. Individually developed studio project that integrates and extends landscape architectural skills; entails research, interpretation, writing, graphic communication, design, oral presentations.
- 491 Topics in Design 3**
- 499 Special Problems V 1-4** May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 520 The Northern Rocky Mountain Regional Landscape 4 (2-4)** Biophysical characteristics of the Northern Rocky Mountain regional landscape. Cooperative: Open to UI degree-seeking students.

521 Cultural Interpretation of the Regional Landscape 4 (2-4) Cultural characteristics of the Northern Rocky Mountain regional landscape. Cooperative: Open to UI degree-seeking students.

525 Landscape Modeling 3 (1-6) Visual and cartographic landscape modeling through application of GIS and visualization technologies to landscape changes.

530 Philosophies and Theories of the Built Environment 3 Course Prerequisite: Graduate standing in Architecture, Interior Design, or Landscape Architecture. Focus on systematic thought which may describe behavior of the built environment. (Crosslisted course offered as ARCH 530, I D 530, LND ARCH 530).

540 Research Methods 3 Research methods, from quantitative to technical to philosophical, directed toward qualitative research. (Crosslisted course offered as ARCH 540, I D 540, LND ARCH 540).

560 Interdisciplinary Seminar 3 Explores approaches to design thinking in the topic areas of people and place, history, theory and criticism, and physical design. (Crosslisted course offered as ARCH 560, I D 560, LND ARCH 560).

600 Special Projects or Independent Study V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.

700 Master's Research, Thesis, and/or Examination V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

SCHOOL OF DESIGN AND CONSTRUCTION

SDC

100 [ARTS] World of Design and Construction 3 Exploration of architecture, interior design, landscape architecture, and construction management through equity, environment, and economy; careers in the built environment considered.

120 Foundational Drawing 3 (0-6) Development of skills relating to drawing 2D and 3D objects, one and two point perspective as well as orthographic projection.

140 Foundation Studio I 3 (0-6) Course Prerequisite: SDC 120 or concurrent enrollment Exploration and communication of theories and concepts related to basic 2-dimensional and 3-dimensional principles of built space.

250 Global History of Design I 3 Certified major in Architectural Studies, Interior Design, or Landscape Architecture. Global developments in design through the seventeenth century CE.

300 Fabrication Lab Practice 1 Hands-on exploration of School of Design and Construction shop facilities. Students complete a small project while learning safe and efficient use of woodshop machines and hand tools.

350 [M] Global History of Design II 3 Course Prerequisite: Certified major in Architectural Studies, Interior Design, or Landscape Architecture. Global developments in design from the seventeenth century CE to the present day.

444 Integrated Study Tour 1 May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: ARCH 309, I D 277, or LND ARCH 222; certified major in Architecture, Interior Design, Landscape Architecture, or Construction Management. Selected issues in the field of design and construction in connection with an organized field trip.

488 Professional Practice Coop/Internship I V 1-2 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: By department permission. Practicum for students admitted to the VCEA Professional Practice and Experiential Learning Program; integration of coursework with on-the-job professional experience. (Crosslisted course offered as ENGR 488, BIO ENG 488, CHE 488, CE 488, CPT S 488, E E 488, ME 488, MSE 488, SDC 488). S, F grading.

489 Professional Practice Coop/Internship II 1 May be repeated for credit; cumulative maximum 3 hours. Course Prerequisite: Sophomore standing; by department permission. Practicum for students admitted to the VCEA Professional Practice and Experiential Learning Program; continuation of ENGR 488. (Crosslisted course offered as ENGR 489, SDC 489). S, F grading.

555 Global Engagement in Design and Construction 3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Graduate student in Architecture, Interior Design, or Landscape Architecture. Engagement with contemporary and historical issues relevant to the built environment, landscape, climate, industry, and/or culture of the city, region, or country under consideration.

Program in Digital Technology and Culture

dtc.wsu.edu
Avery Hall 202
509-335-2581

Professors, B. Condon, S. Ross; Associate Professors, K. Arola, K. C. Withey, P. Ericsson; Assistant Professors, M. Edwards, A. Davis (Tri-Cities), R. Whitson; Clinical Assistant Professors, L. Hunter, J. Kuure; Instructors, S. Anderson, K. Carlson Becker; Clinical Instructor, R. Goodrich; Coordinators, K. Christen Withey (Pullman), D. Gast (Tri-Cities).

Digital Technology and Culture is an interdisciplinary degree program that combines the creative production and critical exploration of digital media.

DTC emphasizes a historical, rhetorical, and cultural understanding of digital media so as to prepare students for problem solving and communicating both locally and globally.

The DTC major requires 39 credits composed of a 24-credit core, a concentration of 12 additional credits, and an internship of at least 3 credits.

The DTC core includes five courses that introduce cultural critique and critical production, information structures, design principles, histories of technology and computing, art and technology, and digital diversity. The core also includes three interdisciplinary elective courses in Anthropology, Computer Science, English, Fine Arts, or Sociology. The 12-credit DTC concentration is designed to meet individual interests and strengths. Concentrations are available in Technology and Culture, Media Authoring, and Digital Information Management, although students are encouraged to take courses from both.

Student Learning Outcomes

- Demonstrate competency with technology for designing and distributing digital works in various mediums.
- Demonstrate competency with design principles through both the production and analysis of media objects.
- Demonstrate and articulate an understanding of the way digital media and information function and circulate in multiple cultural contexts.
- Demonstrate an understanding of the history of technological development, from local to global perspectives, and its implications for a variety of mediums.
- Utilize an interdisciplinary perspective in order to understand the global changes brought about by digital media.
- Effectively communicate through writing and speech why and how digital media texts make meaning.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

DIGITAL TECHNOLOGY AND CULTURE (120 HOURS)

DTC Certification Requirements, Pullman Campus

Certification can take place at any point during the semester. To apply for certification a student must have the following: 24 completed hours; a minimum 2.2 GPA; a sample digital text in web authoring, animation, video production, and/or graphic design; and a written statement of purpose (approximately 500-750 words) explaining how the DTC major supports the student's career goals. This statement should also describe how the sample digital text was produced and justify the text's overall design choices. Certification applications will be reviewed by a committee that includes the DTC Director, Assistant Director, and one DTC instructor or a graduate student teaching DTC courses. Transfer students with 55 or more hours should complete the certification requirements within two semesters. All students should certify before earning 90 hours.

No DTC course (DTC 355, 356, 375, 475, and FINE ART 331) may be taken on a pass, fail basis.

First Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3
Humanities [HUM]	3
Quantitative Reasoning [QUAN]	3
Foreign Language or Electives	3 or 4
<i>Second Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI]	4
Communication [COMM] or Written Communication [WRTG]	3
FINE ART 102 ¹	3
HISTORY 105 [ROOT]	3
Foreign Language or Electives	3 or 4

Second Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
Social Sciences [SSCI]	3
Electives	9
<i>Second Term</i>	<i>Hours</i>
DTC 356	3
DTC Concentration Elective ²	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI]	4
Electives	4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
DTC 355 [M]	3
DTC 375 [M]	3
DTC Core Option ³	3
FINE ART 331	3
Electives	3
<i>Second Term</i>	<i>Hours</i>
Diversity [DIVR]	3
DTC 475	3
DTC Concentration Elective ²	3
DTC Core Option ³	3
Electives	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
DTC Concentration Elective ²	6
DTC Core Option ³	3
Integrated Capstone [CAPS]	3
Electives	3
<i>Second Term</i>	<i>Hours</i>
Senior Seminar, Thesis, or Internship	3
Electives	12

¹ Prerequisite to FINE ART 331.

² Approved Concentration Electives include: ANTH 330, 350; CPT S 322 [M], 355, 401, 442, 443 [M]; DTC 335, 336, 338, 354, 476, 477, 478; ENGLISH 300, 301, 336, 337, 354, 357, 360, 361, 401, 402 [M], 405, 458, 476, 477, 478; FINE ART 332, 333, 337, 363, 380, 433, 434, 435; FOR LANG 304 [M], 350; HISTORY 300 [M]; HUMANITY 304; MIS 322 [M], 325, 372 [M], 374, 441; POL S 317; PSYCH 492; SOC 373, and 430.

³ Approved Core Options include: ANTH 350; CPT S 401; DTC 354; ENGLISH 301, 402 [M]; FINE ART 332, 333; FOR LANG 350; and SOC 373.

Minors

Digital Technology and Culture

A minor in DTC requires 18 hours including DTC 101, 201, DTC/ENGLISH 336, 355, and 375, plus one more 3-hour course from the following: DTC 335, 356, 435, 477, 478, FINE ART 331, 332, 333, 363, 434, or 435. 9 hours of upper-division work must be taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Description of Courses

DIGITAL TECHNOLOGY AND CULTURE

DTC

101 [ARTS] Introduction to Digital Technology & Culture 3 Inquiry into digital media, including origins, theories, forms, applications, and impact with a focus on authoring and critiquing multimodal texts.

201 [ARTS] Tools and Methods for Digital Technology 3 An introduction to the tools and methods of production for multimedia authoring in digital contexts.

335 Digital Animation: Story, Narration and Production 3 (2-2) 3-D digital animation for creative and professional presentations using Maya software, art skills, story-telling and team problem-solving techniques.

336 Composition and Design 3 Course Prerequisite: DTC 201. Design practices and process for composing for a multimedia environment including color, pattern and shape. (Crosslisted course offered as DTC 336, ENGLISH 336).

338 Special Topics in Digital Technology and Culture 3 May be repeated for credit; cumulative maximum 6 hours. Major trends or artists in digital technology and culture.

354 Digital Storytelling 3 Nonlinear, multi-linear, and interactive narrative using elements of creative writing such as character, dialog, setting, plot and image. (Crosslisted course offered as DTC 354, ENGLISH 354).

355 [M] Multimedia Authoring: Exploring New Rhetorics 3 Writing for new computer-based media; multimedia authoring project; examination of new rhetorics of information technology. (Crosslisted course offered as DTC 355, ENGLISH 355).

356 Information Structures 3 Course Prerequisite: DTC 101. Social and cultural role of information; research with electronic sources; production, validation, storage, retrieval, evaluation, use, impact of electronic information. (Crosslisted course offered as DTC 356, ENGLISH 356).

375 [M] Language, Texts and Technology 3 Course Prerequisite: DTC 101. Relationship between technology and communication; writing practices from a historical point of view. (Crosslisted course offered as DTC 375, ENGLISH 375).

435 Advanced Animation 3 (2-2) Course Prerequisite: DTC 335. Advanced investigation of tools and methods for 2D and 3D digital animation. (Crosslisted course offered as DTC 435, ENGLISH 435).

475 Digital Diversity 3 Course Prerequisite: Junior standing. Cultural impact of electronic media, especially the World-Wide Web; issues of race, class, gender, sexuality online. (Crosslisted course offered as AMER ST 475, DTC 475, ENGLISH 475).

476 Digital Literacies 3 Course Prerequisite: DTC 375. Development and use of new literacies as they affect communication through technology. (Crosslisted course offered as DTC 476, ENGLISH 476).

477 Advanced Multimedia Authoring 3 Course Prerequisite: DTC or ENGLISH 355. Advanced writing, imaging and teamwork skills for authoring in new computer-based media; website project in client-oriented context. (Crosslisted course offered as DTC 477, ENGLISH 477).

478 Usability and Interface Design 3 (0-6) Course Prerequisite: DTC or ENGLISH 355. Design of websites using best practices of visual literacy, interface architecture and usability. (Crosslisted course offered as DTC 478, ENGLISH 478).

497 Senior Seminar 3 Course Prerequisite: Completion of Junior Writing Portfolio; certified major in Digital Technology and Culture; senior standing. Major multimedia project for nonprofit organization or small business with special focus on project management, planning, and execution.

498 Internship V 2-9 May be repeated for credit; cumulative maximum 9 hours. Direct professional learning experiences in the area of digital media, technology, and culture. S, F grading.

499 Special Problems V 1-4 May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: Certified major in Digital Technology and Culture; junior standing. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.

560 Critical Theories, Methods, and Practice in Digital Humanities 3 History, theory, and practice of digital humanities, with attention paid to how digital humanities are transforming disciplinary knowledge. (Crosslisted course offered as ENGLISH 560, DTC 560).

561 Studies in Technology and Culture 3

Foundation examination of key concepts, tools, and possibilities afforded by engaging with technology through a critical cultural lens. (Crosslisted course offered as DTC 561, ENGLISH 561).

School of Economic Sciences

ses.wsu.edu
Hulbert 101
509-335-5555

Professor and Director, H. A. Love; Professor and Associate Director, V. A. McCracken; Regents Professors, R. C. Mittelhammer, C. R. Shumway; Professors, R. G. Batina, K. L. Casavant, T. R. Fortenbery, T. L. Marsh, J. J. McCluskey, R. E. Rosenman, P. R. Wandschneider, J. K. Yoder; Associate Professors, J. Bai, A. S. Cassey, H. H. Chouinard, A. Espinola-Arredondo, G. I. Galinato, R. K. Gallardo, E. Jessup, B. Mandal, F. Munoz-Garcia, J. S. Neibergs, J. Yan; Assistant Professors, M. P. Brady, B. W. Cowan, M. J. Gibson, E. A. Gurocak, R. Iles, P. Kuzyk, A. Prera.

The School of Economic Sciences (SES) offers programs leading to the degree of Bachelor of Science in Economic Sciences with options in Agricultural Economics; Business Economics; International Economics and Development; Economics, Policy and Law; Environmental and Resource Economics; Financial Markets; and Quantitative Economics. Graduate degrees offered include the Master of Science in Applied Economics, Doctor of Philosophy (Economics and Agricultural Economics).

The School also advises the Bachelor of Science in Agricultural and Food Systems, the Agricultural and Food Business Economics major.

Undergraduate Program

The course of study for the Bachelor of Science in Economic Sciences is sufficiently broad to accommodate students with a variety of interests and career goals. It provides training for students interested in business, law, finance, agricultural markets, environmental policy and natural resources, and economic development. The program also gives students the preparation needed for graduate study in business, law, agricultural economics, finance, and general economics. The program provides students the flexibility to choose courses outside the School of Economic Sciences while still meeting degree requirements and allows students to pursue double majors in such fields as business, math, or political science.

The degree requires a set of core courses taken by all School of Economic Sciences undergraduate students. These courses develop a deep understanding of the basic principles of economics and the research methods needed for economic analysis in any field of economic sciences. Students then branch out to further apply the core tools in one of seven option areas:

- The *agricultural economics* option deals with economic issues related to food and fiber supply and demand and the natural resource base that supports agricultural production and societal needs. Applications to public decision making and private decisions of farms, ranches, and agribusinesses are considered.

- The *business economics* option trains students to use economic concepts and data analysis skills to better understand the management, marketing, and finance problems faced by businesses operating in a market system.

- The *international economics and development* option provides students an understanding of how policies, institutions and endowments influence physical, human, and natural capital accumulation which leads to the emergence of poor and rich communities and countries.

- The *economics, policy and law* option provides students with the analytical skills used in law school and policy-making including those relevant in tax, law, regulation, program, policy and project arenas.

- The *environmental and resource economics* option trains students to make decisions while carefully weighing the trade-offs between protecting, restoring, developing, and allocating natural resources.

- The *financial markets* option provides students with a solid, analytical training in the substantial overlap between economics and finance. The option requires coursework that focuses on the analysis of financial markets.

- The *quantitative economics* option provides students with the skills to understand and use more advanced statistical and mathematical models, preparing them for careers involving data analysis or for advanced education -- such as a PhD in economics or related field.

In all options students combine course work in economic sciences with courses outside the School of Economic Sciences. According to their individual interests, students supplement their economic sciences training with elective coursework in the areas of business, agriculture, computer science, mathematics, engineering, environmental science, philosophy, history, and/or political science.

The School of Economic Sciences also advises the college-wide Agricultural and Food Business Economics major. This major focuses on agricultural business with an emphasis in economics. Please visit <http://afs.wsu.edu> for more information.

Student Learning Outcomes

Graduates from the School of Economic Sciences will evaluate and apply economic concepts and quantitative methods; will think critically, integrate concepts, and evaluate results in performing economic analyses; and will communicate effectively. Students will be able to apply economic concepts, together with quantitative methods and technical information relating to the decision environment, to assist policy makers and target groups in evaluating economic trade-offs and in making rational economic decisions. Graduates will also be capable of analyzing and evaluating broad economic and social problems concerning the allocation of individual, firm and social resources within their specific degree interest area. Students will be capable of communicating the results of economic analyses in a clear, compelling, and informative manner.

These core economic concepts and quantitative skills are listed on the SES website at <http://cahnrs-cms.wsu.edu/ses/undergrad/Pages/LearningOutcomes.aspx>.

A wide variety of courses is available to non-majors who want to take selected courses to

support their programs in other departments. Students from other departments may declare a minor in economics, agribusiness economics, business economics, environmental and resource economics and management, or sustainable development (see below).

The school advises for the interdisciplinary sustainable development minor that addresses how economic and social systems interact with major resource and environmental issues, both internationally and domestically. This is an interdisciplinary program with participation by the departments such as Anthropology, Architecture, Economics, International Business, Political Science, the School of the Environment, and Sociology. The program is built on the premise that as a society we have a responsibility to ourselves and to future generations to steward resources in ways that foster long-term environmental and socio-cultural health and economic viability for all peoples.

Transfer Students

Students planning to transfer to Washington State University from other institutions should take courses that meet the 100- and 200-level course requirements in economics, mathematics, accounting, English, communication, and University Common Requirements (UCORE). Students planning to transfer into economic sciences by the end of their sophomore year should have satisfactorily completed the required introductory economics, statistics, and mathematics courses if they plan to complete the required work for a degree in two additional years.

Preparation for Graduate Study

Students planning to pursue graduate study in economics or agricultural economics are urged to select the quantitative economic option and consult with a faculty member in the School of Economic Sciences. All options, however, prepare students for graduate school but are less quantitatively focused.

Students planning graduate study are advised to develop strong skills through courses in English composition, and additional work in statistics and mathematics. Coursework recommendations for specific graduate areas include:

- Law School: ACCTG 230; B LAW 210; PHIL 103, 201; POL S 300; and, depending on legal interests, elective Econ courses from the following: ECONS 322, 324, 327, 425, 451; B LAW 411 suggested.

- Business School: ACCTG 230, 231; MIS 250. Additional courses in business are not required for admission to most graduate schools of business. It might be useful, however, to take introductory courses in the major areas of business: B LAW 210, FIN 325, MGTOP 340, MKTG 360, ECONS 352 and ECONS 452.

- Economics and Agricultural Economics: MATH 171 and 220 are recommended to satisfy the major's math requirements. Calculus through MATH 273 is also useful.

- Public Administration: ACCTG 230 and POL S 340; MIS 250 and POL S 443, 446 recommended. Elective: ECONS 322.

Employment Opportunities

The undergraduate program provides the basic knowledge and tools necessary to secure professional positions in a wide range of industries and public

organizations. A number of students take graduate work to broaden their career opportunities. School of Economics Sciences graduates compete favorably for jobs in government, business, and non-governmental organizations, using their strong analytical skills to offer a different perspective for problem-solving and decision-making. Recent graduates have been employed in finance, banking, agribusiness, industry, internet-based companies, non-profit organizations, government agencies, and at universities. Many are working in foreign countries.

Graduate Program

The Master of Sciences in Applied Economics provides specialization and research experience appropriate for positions in private corporations and government service as management specialists, policy analysts, forecasters or economic consultants. Students can focus their studies in general economics, business economics or agribusiness, or environmental and resource economics by selecting supporting and elective courses.

The School of Economic Sciences offers two doctoral programs – the Ph.D. in economics and the Ph.D. in agricultural economics. Both degrees prepare students for careers as professional economists in academic, government, international organizations, or the private sector. The program provides students with an excellent foundation in the theory and methods of economics along with applications in their choice of at least two Ph.D. fields. To further strengthen their quantitative training, students may simultaneously pursue a Master of Science in statistics.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

AGRICULTURAL ECONOMICS (120 HOURS)

First Year

First Term	Hours
ECONS 101 [SSCI] or 102 [SSCI]	3
HISTORY 105 [ROOT]	3
Humanities [HUM]	3
MATH 201 ¹	3
Electives	3

Second Term	Hours
Biological Sciences [BSCI]	3 or 4
ECONS 101 or 102	3
ENGLISH 101 [WRTG]	3
MATH 202 [QUAN] ¹	3
Concentrated Area Course ²	3

Second Year

First Term	Hours
CHEM 101 [PSCI] OR CHEM 105 [PSCI]	4
COM 102 [COMM], COM 210 [COMM], or H D 205 [COMM]	3 or 4
Diversity [DIVR]	3
ECONS 301	3
Concentrated Area Course ²	3

Second Term	Hours
ACCTG 230	3
BLAW 210	3
Creative & Professional Arts [ARTS]	3
ECONS 302	3
STAT 212 or MGTOP 215	4
Complete Writing Portfolio	

Third Year

First Term	Hours
ACCTG 231	3
Concentrated Area Course ²	3
ECONS 311 [M]	3
Sequence Course ³	3
Electives	1

Second Term	Hours
Concentrated Area Course ²	3
ECONS 335 OR FIN 325	3
Sequence Course ³	3
Electives	6

Fourth Year

First Term	Hours
ECONS 431	3
ECONS 483, 495, 497, 499, or HONORS 450	3
ECONS 490 [CAPS] [M]	3
ENGLISH 301, 402 [M], or 403 [M]	3
Sequence Course ³	3

Second Term	Hours
Sequence Course ³	3
400-level ECONS Elective ⁴	3
Electives	9

¹ Alternative to MATH 201 is MATH 106, 172, or 220; alternative to MATH 202 is MATH 171.

² Concentrated Area Courses: Four courses from any one of the following concentration areas: (1) Agricultural Production: ANIM SCI 101, HORT/CROP SCI 102 or ENTOM 150, CROP SCI 360, MGTOP 340; (2) Real Estate & Land Management: FIN 325, 345, 445 [M], MIS 250; (3) Food Safety & Policy: FS 110, 201, 220, 303; (4) Globalization: two semesters foreign language, CRS 441, ECON 327/I BUS 470, ECONS 428, 430, SOC 415; (5) Sustainability: CROP SCI 360, ECONS 326/SOC 375, ENVR SCI 101, 285; (6) Independent Concentration - upon approval of advisor.

³ Pick two sequences (4 courses): ECONS 350 + 450 [M]; or ECONS 351 + 451; or ECONS 352 + 452 [M].

⁴ Any 400-level ECONS course not used to fulfill major requirements.

BUSINESS ECONOMICS (120 HOURS)

First Year

First Term	Hours
Biological Sciences [BSCI] or SCIENCE 101 [SCI] ¹	3 or 4
ECONS 101 [SSCI] or 102 [SSCI]	3
HISTORY 105 [ROOT]	3
Humanities [HUM]	3
MATH 201 ²	3

Second Term	Hours
ECONS 101 or 102	3

ENGLISH 101 [WRTG]	3
MATH 202 [QUAN] ²	3
Physical Sciences [PSCI] or SCIENCE 102 [SCI] ¹	3 or 4
Electives	3

Second Year

First Term	Hours
COM 102 [COMM], COM 210 [COMM], or H D 205 [COMM]	3 or 4
Diversity [DIVR]	3
ECONS 301	3
Electives	6

Second Term	Hours
300-400-level ECONS Elective ³	3
Creative & Professional Arts [ARTS]	3
ECONS 302	3
STAT 212 or MGTOP 215	4
Electives	2
Complete Writing Portfolio	

Third Year

First Term	Hours
300-400-level ECONS Elective ³	3
ACCTG 230	3
ECONS 311 [M]	3
ECONS 323	3
Electives	3

Second Term	Hours
400-level ECONS Elective ³	3
ECONS 320	3
ECONS 335	3
ECONS 352	3
Concentrated Area Course ⁴	3

Fourth Year

First Term	Hours
ECONS 452 [M]	3
ECONS 483, 495, 497, 499, or HONORS 450	3
ENGLISH 301, 402 [M], or 403 [M]	3
Concentrated Area Course ⁴	3
Electives	3

Second Term	Hours
400-level ECONS Elective ³	3
ECONS 425	3
ECONS 490 [CAPS] [M]	3
Concentrated Area Course ⁴	3
Electives	3

¹ For a total of 7 credits—one Biological Science [BSCI] and one Physical Science [PSCI] course, including one lab course, or 8 credits of [SCI] designated courses. (SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI], which is offered Spring semester.)

² Alternative to MATH 201 is MATH 106, 172, or 220; alternative to MATH 202 is MATH 171.

³ ECONS courses not used to fulfill major requirement.

⁴ Completion of three courses from one of the following concentration areas: (1) Commodity Marketing: ECONS 351, 426, 451; (2) Consumer Marketing: MKTG 360, two 300-400-level MKTG courses; (3) Management: MGMT 301, two 300-400-level MGMT courses; (4) Logistics: ECONS 426, MGTOP 340, 452.

**ECONOMICS, POLICY AND LAW OPTION
(120 HOURS)****First Year**

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] or SCIENCE 101 [SCI] ¹	3 or 4
Creative & Professional Arts [ARTS]	3
ECONS 101 [SSCI] or 102 [SSCI]	3
HISTORY 105 [ROOT]	3
MATH 201 ²	3

<i>Second Term</i>	<i>Hours</i>
ECONS 101 or 102	3
ENGLISH 101 [WRTG]	3
MATH 202 [QUAN] ²	3
PHIL 103 [HUM]	3
Physical Sciences [PSCI] or SCIENCE 102 [SCI] ¹	4 or 3

Second Year

<i>First Term</i>	<i>Hours</i>
COM 102 [COMM], 210 [COMM], or H D 205 or 4	3
ECONS 301	3
Policy or Law Emphasis Course ³	3
Electives	5
<i>Second Term</i>	<i>Hours</i>
300-400-level ECONS Electives ⁴	6
ECONS 302	3
STAT 212 or MGTOP 215	4
Electives	2
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
ECONS 311 [M]	3
ECONS 320	3
ECONS 322 [M]	3
ECONS 323, 324, or 330	3
Electives	3
<i>Second Term</i>	<i>Hours</i>
Diversity [DIVR]	3
Policy or Law Emphasis Courses ³	6
Electives	6

Fourth Year

<i>First Term</i>	<i>Hours</i>
ECONS 431	3
ECONS 483, 495, 497, 499, or HONORS 450	3
ECONS Option Course ⁵	3
ENGLISH 301, 402 [M], or 403 [M]	3
Policy or Law Emphasis Course ³	3
<i>Second Term</i>	<i>Hours</i>
ECONS 400-level Elective	3
ECONS 420	3
ECONS 490 [CAPS] [M]	3
ECONS Option Course ⁵	3
Electives	3

¹ For a total of 7 credits—one Biological Science [BSCI] and one Physical Science [PSCI] course, including one lab course, or 8 credits of [SCI] designated courses. (SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI], which is offered Spring semester.)

² Alternative to MATH 201 is MATH 106, 172, or 220; alternative to MATH 202 is MATH 171.

³ Policy or Law Emphasis course selection: (1) Policy: ECONS 430, POL S 316, 416, and PHIL 472 [M]; (2) Law: POL S 300; one of PHIL 360, 365, or 370; and two of PHIL 201, POL S 101, 206, 402, 404 [M], or CRM J 320

⁴ ECONS courses not used to fulfill major requirement.

⁵ ECONS Option Courses: ECONS 424, 425, 427, or 451

**ENVIRONMENTAL AND RESOURCE
ECONOMICS
(120 HOURS)****First Year**

<i>First Term</i>	<i>Hours</i>
ECONS 101 [SSCI] or 102 [SSCI]	3
HISTORY 105 [ROOT]	3
Humanities [HUM]	3
MATH 201 ¹	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
Biological Sciences [BSCI] or SCIENCE 101 [SCI] ²	3 or 4
ECONS 101 or 102	3
ENGLISH 101 [WRTG]	3
MATH 202 [QUAN] ¹	3
Electives	3

Second Year

<i>First Term</i>	<i>Hours</i>
COM 102 [COMM], COM 210 [COMM], or H D 205 [COMM]	3 or 4
Diversity [DIVR]	3
ECONS 301	3
ECONS 322 [M]	3
Physical Sciences [PSCI] or SCIENCE 102 [SCI] ²	3 or 4
<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
ECONS 302	3
STAT 212 or MGTOP 215	4
Concentrated Area Course ³	3
Electives	2
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
ECONS 300-400-level Elective	3
ECONS 311 [M]	3
ECONS 330	3
Concentrated Area Course ³	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
ECONS 300-400-level Elective	3
ECONS 326	3
Concentrated Area Course ³	3
Electives	6

Fourth Year

<i>First Term</i>	<i>Hours</i>
ECONS 427	3
ECONS 430	3
ECONS 431	3

ECONS 483, 495, 497, 499, or HONORS 450	3
Environmental Option Course ⁴	3

<i>Second Term</i>	<i>Hours</i>
ECONS 490 [M] [CAPS]	3
ENGLISH 301, 402, or 403	3
Environmental Option Course ⁴	3
Electives	6

¹ Alternative to MATH 201 is MATH 106, 172, or 220; alternative to MATH 202 is MATH 171.

² For a total of 7 credits—one Biological Science [BSCI] and one Physical Science [PSCI] course, including one lab course, or 8 credits of [SCI] designated courses. (SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI], which is offered Spring semester.)

³ Three courses from any one of the following concentration areas: (1) Human Health & the Environment: ANTH 405, CE 341, ENVR SCI 402, ENVR SCI 445, IPM 452, PHIL 370; (2) Global Environment: CROP SCI 360, ENVR SCI 285, ENVR SCI 335, GEOLOGY 315, HISTORY 494, PHIL 370, SOC 332; (3) Renewable Resources: Forest, Wildlife & Biosystems: BIOLOGY 330, BIOLOGY 401, CROP SCI 411, NATRS 300, NATRS 301, NATRS 312, PHIL 370; (4) Non-Renewable Resources: Energy & Minerals: GEOLOGY 340, GEOLOGY 350, GEOLOGY 470, PHIL 370, PHYSICS 408; (5) Independent Concentration - upon approval of advisor (choose 3 courses).

⁴ Environmental Option courses: COMSOC 476 or 477, ENVR SCI 444, NATRS 438, SOIL SCI 368.

**FINANCIAL MARKETS
(120 HOURS)****First Year**

<i>First Term</i>	<i>Hours</i>
ECONS 101 [SSCI] or 102 [SSCI]	3
HISTORY 105 [ROOT]	3
Humanities [HUM]	3
MATH 201 ¹	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
Biological Sciences [BSCI] or SCIENCE 101 [SCI] ²	3 or 4
ECONS 101 or 102	3
ENGLISH 101 [WRTG]	3
MATH 202 [QUAN] ¹	3
Electives	3

Second Year

<i>First Term</i>	<i>Hours</i>
ACCTG 230	3
COM 102 [COMM], COM 210 [COMM], or H D 205 [COMM]	3 or 4
ECONS 301	3
MIS 250	3
Physical Sciences [PSCI] or SCIENCE 102 [SCI] ²	3 or 4

<i>Second Term</i>	<i>Hours</i>
ACCTG 231	3
Creative & Professional Arts [ARTS]	3
ECONS 302	3
MGTOP 215	4
Electives	2

Third Year

<i>First Term</i>	<i>Hours</i>
Diversity [DIVR]	3
ECONS 311 [M]	3
ECONS 320	3
ECONS 322	3
Electives	3
<i>Second Term</i>	<i>Hours</i>
ECONS 300-400-level Elective	3
ECONS 420	3
FIN 325	3
Financial Markets Option Required Course ³	3
Electives	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
ECONS 300-400-level Elective	3
ECONS 483, 495, 497, 499, or HONORS 450	3
ENGLISH 301, 402 [M], 403 [M]	3
FIN 421 OR 427	3
Electives	3
<i>Second Term</i>	<i>Hours</i>
ECONS 400-level Elective	3
ECONS 425 or 427	3
ECONS 490 [M] [CAPS]	3
Financial Markets Option Required Course ³	3
Electives	3

¹ Alternative to MATH 201 is MATH 106, 172, or 220; alternative to MATH 202 is MATH 171.

² For a total of 7 credits—one Biological Science [BSCI] and one Physical Science [PSCI] course, including one lab course, or 8 credits of [SCI] designated courses. (SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI], which is offered Spring semester.)

³ Financial Markets option (6 credits): Approved courses include ECONS 424, FIN 350, 456, STAT/MATH 360; and one 400-level ECONS course not used to fulfill major requirements.

INTERNATIONAL ECONOMICS AND DEVELOPMENT (120 HOURS)

First Year

<i>First Term</i>	<i>Hours</i>
ECONS 101 [SSCI] OR 102 [SSCI]	3
HISTORY 105 [ROOT]	3
Humanities [HUM]	3
MATH 201 ¹	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
Biological Sciences [BSCI] or SCIENCE 101 [SCI] ²	3 or 4
ECONS 101 or 102	3
ENGLISH 101 [WRTG]	3
MATH 202 [QUAN] ¹	3
Electives	3

Second Year

<i>First Term</i>	<i>Hours</i>
COM 102 [COMM], COM 210 [COMM], or H D 205 [COMM]	3 or 4
Diversity [DIVR]	3

ECONS 302	3
Physical Sciences [PSCI] or SCIENCE 102 [SCI] ²	3 or 4
Electives	3

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
ECONS 300-400-level Elective	3
ECONS 301	3
STAT 212 or MGTOP 215	4
Electives	2
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
ECONS 300-400-level Elective	3
ECONS 311 [M]	3
ECONS 322	3
ECONS 324	3
ECONS 327	3

<i>Second Term</i>	<i>Hours</i>
ECONS 300-400-level Elective	3
ECONS 320	3
ECONS 323	3
ECONS 326	3
ECONS 420	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
ECONS 400-level Elective	3
ECONS 427	3
ECONS 431	3
ECONS 483, 495, 497, 499, or HONORS 450	3
ECONS Option Requirement ³	3

<i>Second Term</i>	<i>Hours</i>
ECONS 490 [M] [CAPS]	3
ECONS Option Requirement ³	3
ENGLISH 301, 402 [M], or 403 [M]	3
Electives	6

¹ Alternative to MATH 201 is MATH 106, 172, or 220; alternative to MATH 202 is MATH 171.

² For a total of 7 credits—one Biological Science [BSCI] and one Physical Science [PSCI] course, including one lab course, or 8 credits of [SCI] designated courses. (SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI], which is offered Spring semester.)

³ Two courses from the following option requirements: IBUS 380, ECONS 330, ECONS 428, ECONS 430, POL S 435, SOC 340.

QUANTITATIVE ECONOMICS (120 HOURS)

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] or SCIENCE 101 [SCI] ¹	4 or 3
ECONS 101 [SSCI] or 102 [SSCI]	3
HISTORY 105 [ROOT]	3
MATH 171 [QUAN]	4
Electives	2

<i>Second Term</i>	<i>Hours</i>
ECONS 101 or 102	3
ENGLISH 101 [WRTG]	3
MATH 172	4

Physical Sciences [PSCI] or SCIENCE 102 [SCI] ¹	3 or 4
Electives	2

Second Year

<i>First Term</i>	<i>Hours</i>
COM 102 [COMM], 210 [COMM], or H D 205 [COMM]	3 or 4
Diversity [DIVR]	3
ECONS 301	3
ECONS Emphasis Course ²	2 or 3
Humanities [HUM]	3

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
ECONS 302	3
ECONS Emphasis Course ²	3
MATH 220	2
STAT 212 or MGTOP 215	4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
ECONS 300-400-level Elective ³	3
ECONS 311 [M]	3
ECONS Emphasis Course ²	3
Electives	6

<i>Second Term</i>	<i>Hours</i>
ECONS 300-400-level Elective ³	3
ECONS 420	3
ECONS 424	3
Electives	6

Fourth Year

<i>First Term</i>	<i>Hours</i>
ECONS 400-500-level Elective ³	3
ECONS 483, 495, 497, 499, or HONORS 450	3
MATH 364, 401, or ECONS 526	3
MATH 420 or ECONS 527	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
ECONS 400-500-level Elective ³	3
ECONS 490 [CAPS] [M]	3
ENGLISH 301, 402 [M], or 403 [M]	3
STAT 360, 443, or ECONS 525	3
Electives	3

¹ For a total of 7 credits—one Biological Science [BSCI] and one Physical Science [PSCI] course, including one lab course, or 8 credits of [SCI] designated courses. (SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI], which is offered Spring semester.)

² Economics Emphasis Courses (3 courses required from one area): (1) Math: MATH 273, 301, and 315; (2) Management Operations: MGTOP 340, 412, and 452; (3) Computer Science: CPT S 121, 122, and 224.

³ ECONS courses not used to fulfill major requirement.

Minors

Agribusiness Economics

The minor in Agribusiness Economics requires 18 hours and includes ECONS 101; ECONS 301 or 305; ECONS 350 and 450, or ECONS 351 and 451, or

ECONS 352 and 452; ECONS 335; and 3 elective credits in ECONS. A 2.00 GPA is required in the minor and no courses may be taken pass/fail. 9 hours of upper-division work must be taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Business Economics

To be eligible to certify in a business economics minor, students must have a cumulative 2.0 GPA. A minor in economics requires 18 hours of ECONS courses, nine of which must be at the 300-400 level with an overall 2.0 GPA in the required courses and taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. ECONS 101 and 102 (or 198 and a 300-400-level ECONS course), 305 or 321, 320, 326 or 327, and 404 are required.

Economics

To be eligible to certify in an economics minor, students must have a cumulative 2.0 GPA. A minor in economics requires 18 hours of ECONS courses, nine of which must be at the 300-400-level with an overall 2.0 GPA in the required courses and taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. ECONS 101 and 102 (or 198 and a 300/400-level ECONS course), and 302 or 320 are required. In addition, ECONS 301 or 305, and two 300-level or higher ECONS electives are required (only three hours of ECONS 497 or 499 may be used to fulfill the upper-division ECONS electives requirement).

Environmental and Resource Economics and Management

The minor in Environmental and Resource Economics and Management requires 16 hours. The following courses are required: ECONS 330, 430 or 433, and 431; one of ECONS 301, 305, or 326; and 4 elective credits in ECONS. 9 hours of upper-division work must be taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. A student wishing to declare a minor should consult with an advisor as early as possible to develop the required program.

Sustainable Development

The program offers a minor in sustainable development. The minor is comprised of ECONS 326, one course from each of the following four aspect areas: policy, history, and theory (ENVR SCI 335 [M], HISTORY 409, 494, NATRS 438, PHIL 370, POL S 430, or PSYCH 466); environmental (ARCH 490, 494, BIOLOGY 330, 372 [M], CE 401, CROP SCI 360, ENVR SCI 101, 285, 444, GEOLOGY 303 or NATRS 300); social/cultural (ANTH 203, 309, ANTH/SOC 418, NATRS 312, SOC 331, 332, 415, 430, WOMEN ST 332, or WOMEN ST 460); economic (ECONS 330, 427, 428, 430, 431, I BUS 380, or I BUS 496); and one additional course from any of the aspect areas. The minor requires 18 credit hours, with at least 9 hours at the 300-400 level taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. All coursework for the minor must be graded and a minimum GPA of 2.0 shall be maintained. Students wishing to apply for the minor may do so with the School of Economic Sciences.

Description of Courses

ECONOMIC SCIENCES

ECONS

101 [SSCI] Fundamentals of Microeconomics

3 Course Prerequisite: MATH 101 (or higher), STAT 205, or 212; or concurrent enrollment in MATH 106 (or higher), or STAT 212; or a minimum ALEKS score of 40%. Enrollment not allowed if credit earned for ECONS 198 with a grade of C or higher and ECONS 102. Theory and policy of human responses to scarcity; how this affects business competition, international trade, industrial organization, investment, and income distribution.

102 [SSCI] Fundamentals of Macroeconomics

3 Course Prerequisite: MATH 101 (or higher), STAT 205, or 212; or concurrent enrollment in MATH 106 (or higher), or STAT 212; or a minimum ALEKS score of 40%. Enrollment not allowed if credit earned for ECONS 198 with a grade of C or higher and ECONS 101. Theory and policy related to unemployment, inflation, foreign trade, government spending, taxation, and banking.

198 Economics Honors

3 Course Prerequisite: Admitted to the Honors College. Enrollment in ECONS 198 is not allowed if credit has already been earned for ECONS 101 and 102. Introduction to economic theory and policy issues.

299 Topics in Economics

3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: ECONS 101, 102, or ALEKS math placement score of 45%. Issues in economics.

301 Intermediate Microeconomic Theory with Calculus

3 Course Prerequisite: ECONS 101 or 198; MATH 171 with a C or better, or MATH 202 with a C or better. Calculus-based intermediate microeconomic theory for majors in the School of Economic Sciences.

302 Intermediate Macroeconomic Analysis

3 Course Prerequisite: ECONS 102 or 198; MATH 171 with a C or better, or MATH 202 with a C or better. Income, employment, and inflation theory with policy implications. Recommended preparation: ECONS 101 as required background.

305 Intermediate Microeconomics without Calculus

3 Course Prerequisite: ECONS 101 or 198. Price determination and market behavior under different market structures and the problems posed for public policy; not calculus-based.

311 [M] Introductory Econometrics

3 Course Prerequisite: ECONS 101, 102, or 198; STAT 212 or MGTOP 215; MATH 171 with a C or better, or MATH 202 with a C or better. Methods of empirical analysis in the context of economic analysis and forecasting problems.

320 Money and Banking

3 Course Prerequisite: ECONS 102 or 198. Analysis of banking institutions and monetary policy in the US, with comparison to abroad. Recommended: ECONS 101.

321 Economics of Sports in America

3 Course Prerequisite: ECONS 101 or 198. Economic aspects of American sports; fan demand; advertising; team output decisions; league/conference organization; government and sports.

322 Public Economics

3 Course Prerequisite: ECONS 101 or 198. Theory and practice of the public sector; taxes, expenditures, and administration at local, state, and federal levels.

323 Labor Economics

3 Course Prerequisite: ECONS 101 or 198. Functioning of labor markets; introduction to collective bargaining and labor law.

324 [M] The Economics of Health Care

3 Course Prerequisite: ECONS 101 or 198. The economics of allocating, financing and delivering medical care services. Cooperative: Open to UI degree-seeking students.

325 [M] The Economics of Organization, Contracting, and Law

3 Course Prerequisite: ECONS 101 or 198. Examination of the economic and legal aspects of contractual and non-contractual ways of organizing transactions by business.

326 Aspects of Sustainable Development

3 Course Prerequisite: ECONS 101 or 198. Ecological, economical, and sociological aspects of sustainable development. (Crosslisted course offered as ECONS 326, SOC 375).

327 International Trade and Finance

3 Course Prerequisite: ECONS 101 or 198; ECONS 102 or 198. Analysis and description of international trade flows; commercial policy; multinational firms, foreign exchange markets; open economy macroeconomics; international monetary systems. (Crosslisted course offered as ECONS 327, I BUS 470).

330 Natural Resource Economics

3 Course Prerequisite: ECONS 101 or 198. The role of economics in natural resource management and policy. Course equivalent to OSU's AREC 351.

335 [QUAN] Business Finance Economics

3 Course Prerequisite: MATH 101 with a C or better, 103 with a C or better, 106, 171, 201, 202, or a minimum ALEKS math placement score of 45%. Financial management, decision making, and analysis for small businesses; capital market institutions and valuation processes.

350 Introduction to Farm and Ranch Management

3 Course Prerequisite: ECONS 101 or 198. Decision making, planning, implementation and control of farms and ranches using economic principles, records, financial reports, budgeting and investment analysis.

351 Introduction to Food and Agricultural Markets

3 Course Prerequisite: ECONS 101 or 198. Introduction to futures and options; selected topics related to markets for and the marketing of food and agricultural products.

352 Business Management Economics

3 Course Prerequisite: ECONS 101 or 198. Introduction to the economic concepts, techniques and applications of organizational, marketing, financial, operations, and resource management in a firm.

- 391 Special Topics in Economics V** 1-3 Course Prerequisite: ECONS 101 or 198; ECONS 102 or 198. Current topics in economics.
- 404 Economics for Managers 3** Topics in the application of economics for business decision making with an introduction to calculus. Credit not granted to graduate students in the School of Economic Sciences.
- 420 Monetary Theory and Policy 3** Course Prerequisite: ECONS 301; ECONS 302. Current issues in monetary economics with a special emphasis on policy.
- 424 Strategy and Game Theory 3** Course Prerequisite: ECONS 301. Strategic behavior of firms, consumers, and political parties in everyday interaction. Cooperative: Open to UI degree-seeking students.
- 425 Industrial Organization 3** Course Prerequisite: ECONS 301. Economic theories of firm behavior and the influence of market industry parameters; buyer/seller concentration, information asymmetries, product differentiation, and entry conditions.
- 426 Transportation Economics 3** Course Prerequisite: ECONS 301; ECONS 311. Transportation economics and relevant transportation modeling; policy issues and concerns.
- 427 Economic Development 3** Course Prerequisite: ECONS 301 or 305. Development theories, policies, and performance of Third World economies; population, land reform, foreign trade, aid, investment, debt, dependency.
- 428 Global Capitalism Today: Perspectives and Issues 3** Course Prerequisite: ECONS 101 or 102. Logic and consequences of capitalism as global system; multinational corporations; underdevelopment and overdevelopment; external debt, population, and environmental crisis.
- 430 Managing the Global Environment 3** Study of policy and management tools to address environmental issues of global significance.
- 431 Economic Analysis of Environmental and Natural Resource Policies 3** Course Prerequisite: ECONS 301. Nature and practice of environmental policy analysis using economics concepts and the analysis of models applied to natural resource problems and issues.
- 433 Topics in International Environmental Law, Policy and Institutions 3** Interdisciplinary study of the political development of the European Union and its impact on modern Italy; natural resource, environmental and agricultural policy and law.
- 450 [M] Advanced Farm and Ranch Management 3** Course Prerequisite: ECONS 101 or 198; ECONS 350. Business and financial principles applied to organization and operation of farms and ranches.
- 451 Advanced Food Economics and Marketing 3** Course Prerequisite: ECONS 301, 305, or 351; ECONS 311. Institutions, practices, policies, problems, and empirical analysis of food economics and marketing.
- 452 [M] Advanced Business Management Economics 3** Course Prerequisite: ECONS 301; MATH 171 or MATH 202; MGTOP 215 or STAT 212. Topics in business management economics and strategy, from demand and supply to bargaining, contracting, pricing strategies, and market structure. Recommended preparation: ECONS 350 or ECONS 352 as required background.
- 453 International Trade and Marketing 3** Course Prerequisite: ECONS 301; ECONS 311. Application of economic theory to the analysis of international trade and marketing.
- 483 Special Topics: Study Abroad V** 1-15 May be repeated for credit.
- 490 [CAPS] [M] Economics Capstone 3** Course Prerequisite: ECONS 301; ECONS 302; ECONS 311; average of these three courses needs to be a 2.0 GPA or better. Integration of economic theory and field courses; assessment.
- 491 Advanced Topics in Economics V** 1-3 Course Prerequisite: ECONS 301; ECONS 302; ECONS 311. Advanced topics in economics.
- 495 Instructional Practicum V** 1-3 Academic experience in teaching and tutoring undergraduate courses in economics. S, F grading.
- 497 Economics Internship V** 2-12 May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: By department permission. Professional off-campus internships arranged or coordinated by departmental faculty according to student's field of specialization. S, F grading.
- 499 Special Problems V** 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 500 Macroeconomic Theory I 3** Introduction to dynamics, growth and investment, overlapping generations models, Ramsey model, consumption and investment. (Crosslisted course offered as ECONS 500, FIN 500). Required preparation must include intermediate macroeconomics and one year of calculus. Required preparation must include intermediate macroeconomics and one year of calculus.
- 501 Microeconomic Theory I 3** Microeconomic theory, multivariate optimization, consumer and producer theory, competitive partial equilibrium, introduction to imperfect competition. (Crosslisted course offered as ECONS 501, FIN 501). Required preparation must include intermediate microeconomics and one year of calculus. Required preparation must include intermediate microeconomics and one year of calculus.
- 502 Macroeconomic Theory II 3** Course Prerequisite: ECONS 500. Macroeconomic theory, short-run fluctuations and nominal rigidities, monetary economics and inflation, real business cycle models, unemployment international macroeconomics. (Crosslisted course offered as ECONS 502, FIN 502).
- 503 Microeconomic Theory II 3** Course Prerequisite: ECONS 501. General equilibrium, welfare economics and social choice, market failure, game theory, economics of information. (Crosslisted course offered as ECONS 503, FIN 503).
- 504 Production and Consumption Economics 3** Course Prerequisite: ECONS 502; ECONS 503. Advanced duality topics, demand and supply system modeling, financial economics and risk.
- 505 Economics for Agricultural Decision Making 3** Managerial economics with specific applications to agricultural issues.
- 506 Mathematics Primer for Economists 3** Intensive overview of the essential mathematical tools needed for graduate study in topics of economic sciences.
- 510 Statistics for Economists 3** Statistical theory underlying econometric techniques utilized in quantitative analysis of problems in economics and finance. (Crosslisted course offered as ECONS 510, FIN 510). Required preparation must include college calculus and matrix algebra. Required preparation must include college calculus and matrix algebra.
- 511 Econometrics I 3** Course Prerequisite: ECONS 510. Single equation linear and nonlinear models; estimation, inference, finite and asymptotic properties, effects and mitigation of violations of classical assumptions. (Crosslisted course offered as ECONS 511, FIN 511).
- 512 Econometrics II 3** Course Prerequisite: ECONS 501; ECONS 511. Econometric methods for systems estimation; simultaneous equations, discrete and limited dependent variable, panel data, and time series data. (Crosslisted course offered as ECONS 512, FIN 512).
- 513 Econometrics III 3** Course Prerequisite: ECONS 502; ECONS 503; ECONS 512. Linear and non-linear models and maximum likelihood estimation and inference; semi-parametric and parametric methods; limited dependent variable models.
- 514 Econometrics IV 3** Course Prerequisite: ECONS 502; ECONS 503; ECONS 512. Constrained estimation, testing hypotheses, bootstrap resampling, BMM estimation and inference, nonparametric regression analysis, and an introduction to Bayesian econometrics.
- 521 Topics in Economic Sciences V** 1-3 May be repeated for credit; cumulative maximum 6 hours. Current topics in the development and application of the economic sciences. Required preparation must include intermediate micro- and macro-economics, and econometrics course work.
- 522 Financial and Commodity Derivatives 3** Design, trading, structure, and pricing of derivatives; working knowledge of how derivative securities work, how they are used, and how they are priced.
- 525 Master's Econometrics 3** Theory and practice of multiple regression methods; applications to the study of economic and other phenomena; use of computer regression programs. Required preparation must include introductory statistics course. Cooperative: Open to UI degree-seeking students.

- 526 Master's Microeconomic Analysis I** 3 Masters-level, calculus-based analysis of consumer and producer behavior, partial and general equilibrium, and strategic behavior. Required preparation must include intermediate microeconomics and calculus course work. Cooperative: Open to UI degree-seeking students.
- 527 Master's Microeconomic Analysis II** 3 Master's-level, linear algebra-based analysis of consumer and producer theory, comparative statics and constrained optimization. Required preparation must include intermediate microeconomics and calculus course work. Cooperative: Open to UI degree-seeking students.
- 528 Master's Macroeconomics Analysis** 3 Master's-level course to develop a coherent theoretical framework to interpret macro data and to analyze macro policy. Cooperative: Open to UI degree-seeking students.
- 529 Research Methods** V 1-2 May be repeated for credit; cumulative maximum 3 hours. Prepare and communicate professional-quality research with an emphasis on learning how to identify, develop, write, and present research. Cooperative: Open to UI degree-seeking students.
- 532 Environmental and Natural Resource Economics** 3 Economic principles and models applied to natural resource and environmental problems, issues, and policies.
- 533 International Trade and Policy** 3 International trade theories, policies, and research issues related to world trade with emphasis on agricultural commodity markets. Cooperative: Open to UI degree-seeking students.
- 534 Production Economics** 3 Course Prerequisite: ECONS 526. Production economics theory and methods applied to problems of production response, economic optimization, technology, policy, risk and dynamics. Cooperative: Open to UI degree-seeking students.
- 536 Applied Statistics and Econometrics for Economics and Finance** 3 Data and problem driven approach to formulating, estimating, and interpreting models that address problems in the area of finance and financial economics; review relevant basic statistics and probability concepts, and apply these to linear regression, regression diagnostics, and time series econometrics. Recommended preparation: 3-credit introductory statistics (MGTOP 215); 3-credit microeconomics or macroeconomics course; 3-credit mathematics with calculus course; 3-credit introductory finance course.
- 555 Managerial Economics for Decision Making** 3 Course Prerequisite: Admission to the MBA program. Optimal economic decision making for business in a global environment. Not open to economics graduate students.
- 571 International Trade** 3 Course Prerequisite: ECONS 502; ECONS 503; ECONS 511. Recent developments in trade theory and policy, including international factor movements, empirical analysis of trade flows and strategic trade policies.
- 572 International Development** 3 Course Prerequisite: ECONS 502; ECONS 503; ECONS 511. Structural and two-sector growth models of developing countries and countries in transition; empirical estimation of sources of growth.
- 581 Natural Resource Economics** 3 Course Prerequisite: ECONS 502; ECONS 503; ECONS 511. Economic dynamics of natural resource systems.
- 582 Environmental Economics** 3 Course Prerequisite: ECONS 502; ECONS 503; ECONS 511. Economic theory for environmental issues; externalities, property rights, and welfare analysis; policy design and implementation; non-market valuation and cost/benefit analysis.
- 583 Public Sector Economics** 3 Course Prerequisite: ECONS 502; ECONS 503; ECONS 511. Public sector and public choice economics, including government debt and tax policy, public decision making, bureaucratic behavior and rent-seeking, with applications.
- 593 Applications in Microeconomic Topics** 3 Course Prerequisite: ECONS 502; ECONS 503; ECONS 511. Applied topics in healthcare, sports, transportation and other markets.
- 594 Theory of Industrial Organization** 3 Course Prerequisite: ECONS 502; ECONS 503; ECONS 511. Theory of market structure and firm behavior, including price and non-price competition, information and strategic behavior, and technological change. (Crosslisted course offered as ECONS 594, FIN 594).
- 596 Advanced Topics in Financial Economics** V 1-6 May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: Admission to PhD programs in business, or ECONS 500 and ECONS 501. Topics may include financial theory and empirical methods as applied to financial management, investments, international finance, and markets/institutions. (Crosslisted course offered as FIN 596, ECONS 596).
- 598 PhD Research Seminar** 1 May be repeated for credit; cumulative maximum 4 hours. Seminar focusing on PhD students presenting their own research and critically assessing the research of other PhD students. S, F grading.
- 599 Special Topics in Economics** 3
- 600 Special Projects or Independent Study** V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination** V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

702 Master's Special Problems, Directed Study, and/or Examination V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Agricultural Economics or Economics PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Department of Educational Leadership, Sport Studies, & Educational/Counseling Psychology

education.wsu.edu/ELCP/
Cleveland 351

Chair and Professor, K. Ward; Professors, A. Barabasz, M. Barabasz, P. Erdman, B. French, G. Gates, S. Kruse, B. McNeill, M. Trevisan; Associate Professors, O. Adesope, J. Beller, A. Cox, K. Hildenbrand, K. Huggins, S. Ullrich-French, J. Wong; Assistant Professors, K. Carbonneau, R. Catena, C. Connolly, H. Liao, S. Lichen, Y. Rhee, K. Rodela; Clinical Associate Professors, K. Cowin, T. Reiss, J. Steffen; Clinical Assistant Professors, S. Calderone, T. Crawford, T. Goetz, C. Gotch, G. Hill, S. Jedlicka, T. Kim, J. LeBeau, C. Lebens, T. McDonald, D. Mijacevic, P. Morgan, J. Schultz, G. Selby, Z. Strong; Clinical Coordinator, K. Pietz; Instructor, K. Holmstrom, C. Zweifel.

The department offers courses of study leading to a Bachelor of Arts in Sport Management, Bachelor of Science in Athletic Training, or Bachelor of Science in Kinesiology (with majors in sport science, and health and fitness education); and an undergraduate minor in Sport Management and Strength and Conditioning. Masters degrees (Master of Education, Master of Arts in Education) are offered in the areas of educational leadership, educational psychology, and sport management. The Doctor of Philosophy (Education) is offered with specializations in educational leadership and educational psychology. The Doctor of Education is offered in leadership with specialization in Educational Leadership, and Teacher Leadership. The MA in Education with an emphasis in counseling, and the PhD in Education with a specialization in Counseling Psychology, are in teach-out status with no new applicants being accepted.

The Department of Educational Leadership, Sport Studies, and Educational/Counseling Psychology, housed in the College of Education, has excellent facilities for undergraduate/graduate study and

research. The department sponsors and hosts a number of state, national, and international programs. Programs for superintendent, principal, and program administrator certification are available at the Pullman, Spokane, Tri-Cities, and Vancouver campuses. A state-wide cohort-based superintendent program is also available.

The Learning and Performance Research Center serves school districts and state agencies by providing high-quality assessment and evaluation services through grant and contract agreements. The Exercise Physiology & Performance Laboratory (EPPL) provides research, teaching, and exercise testing opportunities to WSU students, faculty, and the Pullman community. The Gait and Posture Biomechanics Laboratory research is focused on (1) the development of a clinical assessment tool to detect fall-risk in pregnant patients, (2) quantifying and reducing the risk of falls for pregnant workers, and (3) improving balance to help sport and exercise performance. The Psychology of Physical Activity Laboratory includes research about optimizing physical activity experiences, motivation for long-term physical activity, and the psychological benefits of physical activity. The Concussion and Sports Medicine Laboratory conducts research (a) to understand how head injuries (traumatic brain injury) affect the patient and develop research based tool for the medical community to evaluate patients post traumatic injury, (b) to evaluate the role neck strength plays in the incidence of concussion, (c) on the biomechanical impacts magnitudes that occur in youth sports, and (d) on the effectiveness of current education in concussion awareness. All the labs provide service and research opportunities for students and the WSU community.

Application for Graduate Study

Students who plan to work toward an advanced degree should contact the Office of Graduate Education in the College of Education. Individuals applying for admission to do graduate work must complete an application to the WSU Graduate School, and submit the following materials to the College of Education Office of Graduate Education: Departmental Application form; a statement of professional objectives; official college transcripts; three (3) letters of recommendation from individuals qualified to comment on the applicant's academic and professional abilities, and the Graduate Record Examination (GRE). Interested students should directly contact the Office of Graduate Education for specific requirements of each program area.

Bachelor of Arts in Sport Management

The Department of Educational Leadership, Sport Studies, and Educational/Counseling Psychology offers a major in Sport Management which leads to a Bachelor of Arts in Sport Management. The Sport Management major provides professional preparation for those students wishing to pursue a management career with sport organizations or in sport businesses. Students must complete a core program in sport management and must select an area of specialization from business or communication. Additional information on the areas of specialization can be obtained from the department. A minimum cumulative GPA of 2.5 is required for certification as a major.

The Sport Management curriculum is designed to enable graduating students to: 1) incorporate an understanding of ethical, legal, and socio-cultural

issues in managerial decision making and policy determinations in sport; 2) employ sound principles of strategic planning, financial management, risk management, and human resource management in sport; 3) apply a fundamental knowledge and practical understanding of sport marketing, communication, and event management principles; 4) utilize critical thinking and abstract reasoning skills in analyzing sport management issues and in managerial planning and decision making; and 5) demonstrate information literacy and oral, written, and group communication skills.

Student Learning Outcomes

The Sport Management curriculum is designed to enable graduating students to:

- Identify and analyze ethical, legal, and socio-cultural issues in managerial decision making and policy determinations in sport.
- Employ principles of strategic planning, and financial and human resource management in sport.
- Assess marketing and media needs in sport and formulate short-term and long-term solutions.
- Develop and apply critical thinking and abstract reasoning skills in analyzing sport management issues and in managerial planning and decision making.
- Demonstrate information literacy and communication skills.
- Conceive, plan, execute, and evaluate a sports event.

Practical application of theory and knowledge is obtained through enrollment in practicum hours during the sophomore, junior, and senior years and through the completion of a 10-12 credit internship at the end of the required coursework. The internship serves as the bridge between the student's college career and opportunities for employment in sport management.

The general prerequisite for enrollment in 300 and 400-level sport management courses is 60 hours of coursework and certification as a Sport Management major or Sport Management minor. Additional prerequisites for specific courses are listed in the course descriptions. The program director must approve any exceptions to these requirements.

Bachelor of Science in Kinesiology

Two kinesiology majors lead to the Bachelor of Science in Kinesiology (Sport Science, and Health and Fitness Education) and share kinesiology courses. Kinesiology majors are composed of a broad spectrum of courses designed to expose students to a variety of experiences, concepts, and philosophies centered on human movement. A grade of C or better must be obtained in all departmental core courses, elective core courses, and in UCORE courses used as prerequisites for departmental courses. All letter-graded courses specifically required for each major must be taken for a letter grade (i.e., not pass, fail). In addition, each major has a specialized curriculum designed to meet the requirements of the appropriate professional experience in which the student is interested. Students interested in Health and Fitness Education must be admitted to the teacher preparation program (see admission requirements under Teaching and Learning).

Student Learning Outcomes

Graduates with a degree in Kinesiology will be able to:

- Identify moral questions, reflect on the implications and apply to discipline issues.
- Be continuous, collaborative learners who further their own professional development and use their abilities to contribute to the profession.
- Identify the central body of knowledge in kinesiology and use scientific literacy, quantitative reasoning and discipline knowledge to analyze contemporary issues.
- Communicate effectively to a broad range of audiences using appropriate traditional and emerging technological media.
- Use pedagogical knowledge to inform their practice.
- Promote respect of diverse populations and thought.

Practical application of theory and knowledge in the Sport Science major is obtained through enrollment in practicum hours during the sophomore, junior, and senior years and through the completion of a 10-12 credit internship at the end of the required coursework. The internship serves as the bridge between the student's college career and opportunities for employment in Sport Science.

Bachelor of Science in Athletic Training

The department offers the Bachelor of Science in Athletic Training, which is a competitive admission program with an application process. The athletic training program at WSU is a rigorous three-year program beginning with a highly competitive admissions policy. Upon acceptance into the program students have access to some of the highest quality learning opportunities available.

Athletic training education uses a competency-based approach both in the classroom and clinical setting. Educational content is based on cognitive (knowledge), psychomotor (skill), and affective (professional behaviors) competencies and clinical proficiencies. Additional policies and procedures are outlined in the ATP Handbook. Given the availability of clinical experiences, students may not be a varsity athlete and an athletic training student.

Certification for athletic training requires the successful completion of a bachelor's degree in athletic training from an institution that has been accredited by the Commission on Accreditation of Athletic Training Education (WSU is accredited through 2020) and successful completion of the national exam given by the Board of Certification.

Student Learning Outcomes

The Athletic Training curriculum is designed to prepare students to:

- Become competent, independent, and critical thinkers by developing into allied health professionals that are proficient in the care of the physically active.
- Accept the role of the athletic training professional and demonstrate a positive attitude regarding the athletic training profession as shown through professional attendance at conferences, in communication with other individuals, and exhibition of solid work habits.
- Adhere to the NATA Code of Ethics and the BOC Standards of Professional Practice, and maintain high moral standards when performing professional duties.
- Continue to develop knowledge and skills beyond Washington State University, and enhance

the athletic training profession by sharing that knowledge and expertise with local, state, and national professional organizations in the role of members of organizational committees via professional and public service.

Undergraduate Minors

The Department of Educational Leadership, Sport Studies, and Educational/Counseling Psychology offers an undergraduate minor in Sport Management and Strength and Conditioning. Courses for the minor may not be taken pass, fail. Students interested in declaring a minor in either Sport Management or Strength and Conditioning should contact the Department of Educational Leadership, Sport Studies, and Educational/Counseling Psychology.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

ATHLETIC TRAINING (120 HOURS)

The athletic training education program is currently accredited by the Commission on Accreditation of Athletic Training Education (CAATE). The athletic training major is designed to provide students with the necessary academic and clinical competencies required to be eligible for certification by the Board of Certification. All students majoring in athletic training will complete the kinesiology core, the athletic training major course work and a minimum of 1200 hours of clinical experience. Due to the intensity and availability of the clinical internship, the program admits a limited number of students. Acceptance into the athletic training program (ATP) is required to certify athletic training as a major and to complete the degree requirements for graduation.

Academic requirements for this application process include but are not limited to 1) a grade of C or better in KINES 262, KINES 267, and KINES 263; 2) a minimum cumulative collegiate GPA of 2.75 or better including the current semester; and 3) current credentialing in CPR/AED for the Healthcare Provider. Students are advised to consult with athletic training advisors early in their academic careers for specific application procedures. Transfer students are welcome to apply for admission into the clinical internship prior to their attendance at WSU. Transfer students desiring admission into the clinical internship program must have been accepted to WSU, have completed the prerequisite course work, and meet academic requirements. Applicants who do not meet the required 2.75 cumulative GPA requirement but have had a semester 2.75 GPA the last two semesters at WSU may complete the application process and be provisionally admitted into the ATP. Transfer students will also have to show one spring semester at WSU with a 2.75 GPA to be eligible. Clinical internship experiences combine the theory and management of sport-related injury/illness under the direct supervision of certified athletic trainers. The clinical experience is guided by progressive clinical competencies and technical standards that assess the student's progress. A minimum of 1200

hands-on clinical experience hours are arranged over six consecutive semesters with a parallel educational cooperative partnership involving the Department of Intercollegiate Athletics and several off-campus sites including clinical experiences at high school and sport medicine facilities. Students are expected to maintain high academic standards and demonstrate progressive clinical competence to remain a part of the ATP. Please refer to the ATP Handbook for additional policies and procedures governing the program experience.

Kinesiology Core courses required for athletic training, health and fitness teaching, and sport science include: KINES 199, 262, 264, 311, 361, 362, 380, 461, 484, BIOLOGY 251.

First Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 102 [BSCI], 106 [BSCI], or 107 [BSCI]	4
HISTORY 105 [ROOT]	3
KINES 267	3
STATS 212 [QUAN]	4

<i>Second Term</i>	<i>Hours</i>
ENGLISH 101 [WRTG]	3
KINES 199	3
KINES 262	4
KINES 263	2
KINES 264	3
Apply to Clinical Internship	

Second Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 140	3
CHEM 101 [PSCI] or 105 [PSCI]	4
KINES 270	3
KINES 291	2
PSYCH 105 [SSCI]	3

<i>Second Term</i>	<i>Hours</i>
COM 102 [COMM] or H D 205 [COMM]	3
KINES 271	3
KINES 275	3
KINES 291	2
KINES 311	3
KINES 361	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 251	4
KINES 305	3
KINES 362	3
KINES 365	3
KINES 392	2

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
KINES 364	3
KINES 380	3
KINES 392	2
KINES 470	3
Electives	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
Humanities [HUM]	3
KINES 313	3
KINES 469 [M]	3

KINES 493	2
Electives	3
<i>Second Term</i>	
Diversity [DIVR]	3
KINES 461 [M]	3
KINES 484 [CAPS]	3
KINES 493	2
Electives	2

HEALTH AND FITNESS TEACHER CERTIFICATE (BS KINESIOLOGY) (139 HOURS)

This major program prepares individuals to teach physical education, health and fitness at the elementary and/or secondary levels. At all levels of instruction, individuals will acquire knowledge and skills necessary to maintain an active life involving movement, physical fitness and proper nutrition. Students will participate in activities that are designed to help them understand and value important health and fitness concepts and the contributions they make to a healthy lifestyle. Course work includes a kinesiology core with additional course work from Teaching and Learning, and the university core requirements.

Minimum Criteria for Certification

Because of the intensity and limited availability of the practicum teaching, the program admits a limited number of students. Acceptance into the teacher certification program (see Teaching and Learning) is required to certify in health and fitness and to complete the degree requirements for graduation. Additional academic requirements for the health and fitness application process include:

1. Minimum WSU cumulative GPA of 2.75.
2. Complete BIOLOGY 102, 251, CHEM 101 and KINES 262 with a grade of C or better.
3. Completion of the minimum criteria for admission to the undergraduate teacher preparation program (see Teaching and Learning for admission requirements). Students are advised to consult with College of Education Student Services advisors early in their academic careers for application procedures. The health and fitness teacher certificate is offered at the Pullman campus only.

First Year

<i>First Term</i>	<i>Hours</i>
CHEM 101 [PSCI] or 105 [PSCI]	4
ENGLISH 101 [WRTG]	3
KINES 199	3
PE ACTIV Course ¹	1
STATS 212 [QUAN]	4

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 102 [BSCI] or 106 [BSCI]	4
BIOLOGY 140	4
HISTORY 105 [ROOT]	3
KINES 264	3
PE ACTIV Course ¹	1

Second Year

<i>First Term</i>	<i>Hours</i>
ENGLISH 201 [WRTG], 301 [WRTG], 302 [M], or 402 [WRTG] [M] ²	3
KINES 262	4
PE ACTIV Course ¹	1

PSYCH 105 [SSCI]	3
TCH LRN 301	3
Certify in Education and Major	
<i>Second Term</i>	
BIOLOGY 251	4
Humanities [HUM]	3
KINES 361	3
PE ACTIV Course ¹	1
PSYCH 230	3
TCH LRN 317	2
Complete May Practicum	
Complete Writing Portfolio	

Third Year

<i>First Term</i>	
Creative & Professional Arts [ARTS]	3
Diversity [DIVR]	3
KINES 266	3
KINES 312 [M]	3
KINES 393	1
KINES 484	3
<i>Second Term</i>	
Integrative Capstone [CAPS]	3
KINES 461 [M]	3
KINES 462	3
KINES 483	3
PE ACTIV Course ¹	1

Fourth Year

<i>First Term</i>	
KINES 311	3
KINES 380	3
KINES 481	3
TCH LRN 464	3
TCH LRN 465	3
TCH LRN 466	2
<i>Second Term</i>	
ED PSYCH 468	3
KINES 313	3
KINES 314	3
TCH LRN 467	3
TCH LRN 469	2
TCH LRN 470	3

Fifth Year

<i>First Term</i>	
TCH LRN 415 (student teaching)	16

¹ 5 PE ACTIV courses required. Must include PE ACTIV 112, 114, 120/121, and 132.

² One from ENGLISH 201, 301, 302 [M] or 402 is required for admission to the Teacher Preparation Education Program. Students who take ENGLISH 302 will need to take an additional [WRTG] or [COMM] course.

SPORT MANAGEMENT (120 HOURS)

WSU seeks to prepare the best possible sport management professionals and therefore seeks highly qualified individuals. Admission to, or continued enrollment in the sport management program may be denied to any candidate who does not meet the minimum criteria.

Applicants who meet the minimum requirements

are eligible for consideration, but not assured admission. Enrollment is limited and admission competitive. Admission application deadlines are October 15, March 15, and August 5, with certification effective the following term. Candidates must complete formal admission procedures and be certified in the Sport Management major prior to taking any 300-400-level Sport Management coursework. The following minimum criteria must be met for consideration for admission:

Minimum Criteria for Certification

1. Completion of at least 30 semester hours of coursework.
2. Minimum WSU cumulative GPA of 2.50.
3. A grade of C or better in each of the following courses: COM 102, ENGLISH 101, MATH [QUAN] UCORE, and SPMGT 276.
4. A written statement (maximum of two pages) describing relevant work experience/involvement in extracurricular activities. This statement will be evaluated on the basis of the breadth and depth of the experiences, as well as for clarity of expression.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] or SCIENCE 101 [SCI] ¹	3 or 4
Diversity [DIVR]	3
ENGLISH 101 [WRTG]	3
Humanities [HUM]	3
Social Sciences [SSCI]	3

<i>Second Term</i>	<i>Hours</i>
COM 102 [COMM]	3
HISTORY 105 [ROOT]	3
MATH 205 [QUAN]	3
Physical Sciences [PSCI] or SCIENCE 102 [SCI] ¹	4 or 3
Electives	3

Second Year

<i>First Term</i>	<i>Hours</i>
ACCTG 230	3
Creative & Professional Arts [ARTS]	3
SPMGT 276	3
Electives	6

<i>Second Term</i>	<i>Hours</i>
Area of Specialization ²	6
SPMGT 290	3
SPMGT 394	2
Electives	6
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
Area of Specialization ²	6
SPMGT 367 [M]	3
SPMGT 374	3
SPMGT 377	3
SPMGT 394	1

<i>Second Term</i>	<i>Hours</i>
Area of Specialization ²	6
SPMGT 365	3
SPMGT 394	1
SPMGT 464	3
SPMGT 468 [M]	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
Area of Specialization ²	3
ENGLISH 402 [M]	3
Integrative Capstone [CAPS]	3
SPMGT 488	2
SPMGT 489	3
SPMGT 490	1

<i>Second Term</i>	<i>Hours</i>
SPMGT 491	10-12

¹ For a total of 7 credits—one Biological Science [BSCI] and one Physical Science [PSCI] course, including one lab course, or 8 credits of [SCI] designated courses. (SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI], which is offered Spring semester.)

² 21 credits in area of specialization required. Business Specialization: any ECONS course or course offered by the College of Business except ACCTG 230. Communication Specialization: Any course offered by the College of Communication.

SPORT SCIENCE (120 HOURS)

The Sport Science major leads to the Bachelor of Science in Kinesiology. The major provides an interdisciplinary understanding of human movement through the study of anatomy, physiology, movement analysis, biomechanics, motor learning, exercise physiology, and sport psychology and ethics. Sport Science provides a foundation for personal training certification, health and fitness club employment, teaching, coaching, physical therapy, and sports medicine.

Because of the high demand for this program, students must meet minimum certification requirements, as listed below, in order to apply to the Sport Science program. Applicants who meet the minimum requirements are eligible for consideration, but not assured admission. Enrollment is limited and admission competitive. Admission application dates are September 1st to 30th, and February 1st to 28th, with certification effective the following term. Candidates must complete formal admission procedures and be certified in the Sport Science major prior to taking any 300- or 400-level courses. The following minimum criteria must be met for consideration for admission:

Minimum Criteria

1. Completion of at least 24 semester hours of coursework.
2. A cumulative GPA of 2.75.
3. A grade of C or better in each of the following courses: KINES 199 and KINES 262.
4. A written statement (maximum of two pages) describing relevant work experience/involvement in extracurricular activities related to Sport Science.

First Year

<i>First Term</i>	<i>Hours</i>
ENGLISH 101 [WRTG]	3
Humanities [HUM]	3
KINES 138	1
KINES 199	3
PSYCH 105 [SSCI]	3
Elective Core ¹	3

<i>Second Term</i>	<i>Hours</i>	
BIOLOGY 140 [BSCI]	3	
HISTORY 105 [ROOT]	3	
KINES 262	4	
KINES 264	3	
STAT 212 [QUAN] or PSYCH 311 [QUAN]	4	

Second Year

<i>First Term</i>	<i>Hours</i>	
BIOLOGY 102, 106, or 107	4	
H D course ²	3	
KINES 266	3	
SOC 245	3	
Elective Core ¹	3	

<i>Second Term</i>	<i>Hours</i>	
CHEM 101 [PSCI] or 105 [PSCI]	4	
COM 102 [COMM] or H D 205 [COMM]	3	
Creative & Professional Arts [ARTS]	3	
H D course ²	3	
Elective Core ¹	3	

Third Year

<i>First Term</i>	<i>Hours</i>	
BIOLOGY 251	4	
KINES 311	3	
KINES 361	3	
KINES 362	3	
Complete Writing Portfolio		

<i>Second Term</i>	<i>Hours</i>	
Diversity [DIVR]	3	
KINES 312 [M]	3	
KINES 314	3	
KINES 380	3	
KINES 390	1	
Electives	3	

Fourth Year

<i>First Term</i>	<i>Hours</i>	
KINES 313	3	
KINES 415	3	
KINES 461 [M]	3	
KINES 484 [CAPS]	3	
Elective Core ¹	2-4	

<i>Second Term</i>	<i>Hours</i>	
KINES 485 ³	12 or 10	

¹ Elective Core (11 credits): Choose from BIOLOGY 107 (if not used to fulfill major requirement), CHEM 102, 106, KINES 267, 305, 490, 499, PSYCH 230, 333, 361, 470, PHYSICS 101, 102, or as approved by advisor.

² H D courses can be chosen from H D 101, 201, 202, 203, or PSYCH 361.

³ Minimum 10 credits required.

Minors**Sport Management**

The minor in sport management requires 18 semester hours of course work. The minor is designed for students with an interest in sport organizations or sport-related business. Sport management is an appropriate area for students with a variety of career interests, including business, communication, law, and social sciences. To be eligible to certify as a sport

management minor a student must have earned at least 60 credit hours, have a minimum cumulative GPA of at least 2.5 and be certified in a major. Graded courses in the minor may not be taken pass/fail. The program director must approve any exceptions to these requirements. Required courses include SPMGT 276 and 290; and 12 hours from SPMGT 367 or SOC 245, SPMGT 365, 374, 377, 394, 464, 468, 496, 497. Credit hours for the minor must include 9 hours of upper-division work taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Strength and Conditioning

The minor in strength and conditioning requires 22 semester hours of course work and practical experience. The minor is designed for students with an interest in pursuing a profession as a strength and conditioning coach, personal trainer, coach, or athletic trainer. To be eligible to certify as a strength and conditioning minor, a student must have earned at least 60 credit hours, have a minimum cumulative GPA of at least 2.75 and be certified in a major. Graded courses in the minor may not be taken pass/fail. Admission is competitive and requires an application process. The minor requires KINES 262, 264, and 311 as prerequisite coursework. Required courses include KINES 305, 362, 380, and 411. In addition, students will have vocational practicum experiences with KINES 412, 413, and 414 under the supervision of approved strength and conditioning experts. Each practicum is 120-150 hours per term, with a required total of 400 hours for the completion of the minor. Credit hours for the minor must include 9 hours of upper-division work taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Description of Courses**COUNSELING PSYCHOLOGY****COUN PSY**

457 [DIVR] Chicano/a Latino/a Psychology 3 Course Prerequisite: AMER ST 216, CES 101, 151, 254, 255, or HISTORY 150. Current psychosocial research and literature relevant to the mental health and psychological wellbeing of Chicana/o Latina/o populations.

501 Historical and Philosophical Foundations of Counseling Psychology 3 Course Prerequisite: Admission to Counseling Psychology PhD program. History of counseling psychology; philosophical and psychological systems; current identity of counseling psychology as an academic discipline and a profession.

502 Social Psychology Foundations in Educational and Counseling Psychology 3 Social psychology with a special emphasis on the relevance to education and counseling psychology.

503 Community Counseling 3 Course Prerequisite: Graduate student in Community Counseling program. Counseling in community settings.

505 Reverence for Life 1 Evaluates and presents cross-disciplinary research regarding the human-animal relationship.

511 Theories, Research, and Techniques in Counseling Psychology I 3 Philosophical assumptions, theory of personality, counseling process, techniques and relevant research in the major theories of counseling and personality. Cooperative: Open to UI degree-seeking students.

512 Counseling Techniques and Microskills 3 Course Prerequisite: COUN PSY 511. Foundation course for all clinical experiences in counseling; communication and interpersonal skills under faculty supervision will be emphasized. Cooperative: Open to UI degree-seeking students.

513 Career Counseling: Theories and Methods 3 Theories, concepts, methods and findings in career counseling; vocational assessment and prediction.

515 Ethics and Professional Problems in Counseling Psychology 3 Professional problems; ethical, legal, and training issues, practices, and new issues. Cooperative: Open to UI degree-seeking students.

516 Life Span Development and Counseling Issues 3 Major theories and issues in human development and their application to counseling practice including case conceptualization, treatment and intervention planning and psychological assessment and research.

517 Diagnoses, Psychopathology and Counseling Psychology 3 Course Prerequisite: COUN PSY 511. Psychopathology and the application of counseling theories to diagnoses, case conceptualization, assessments, treatment plans and research.

518 Theoretical Foundations of Group Counseling 3 Course Prerequisite: COUN PSY 511. History, philosophy and theoretical foundations; the group counselor, members, and issues in group counseling. Cooperative: Open to UI degree-seeking students.

519 Family Therapy 3 Course Prerequisite: COUN PSY 511; COUN PSY 512. Introduces family therapy, its respective theories and models to clinical practice, assessment, and research.

520 Substance Abuse Counseling and Interventions 3 Course Prerequisite: COUN PSY 511; COUN PSY 512. Substance abuse issues, theory, and counseling techniques and interventions.

523 Topics in Counseling Psychology V 1-4 May be repeated for credit; cumulative maximum 8 hours. Recent research, developments, issues, and/or applications in selected areas of counseling psychology.

525 Counseling Diverse Populations 3 Course Prerequisite: COUN PSY 512. Research and theories regarding the influence of culture, gender, and lifestyle on counseling processes; application of appropriate assessment/treatment strategies.

- 527 Individual Appraisal I** 3 Course Prerequisite: ED PSYCH 508; ED PSYCH 509. Cognitive assessment of individuals, with an emphasis on the theoretical background and practical skills needed to administer, score, and interpret individual intelligence tests; assessment of learning disabilities, AD/HD, and individual achievement.
- 528 Individual Appraisal II** 3 Course Prerequisite: ED PSYCH 508; ED PSYCH 509. Interpretation of representative personality assessment inventories and symptom checklists used in counseling practice; integration of results in psychological reports.
- 529 Counselor Supervision: Theory, Research, and Practice** 3 Course Prerequisite: Admission to Counseling Psychology PhD program. Survey of major theoretical approaches, techniques, and research in models of counselor supervision and training.
- 531 Current Issues in School Counseling I** 3 Course Prerequisite: Admission to MA program in School Counseling. Issues of immediate concern to school counselors: drug abuse, family violence, adolescent suicide, sexual orientation, crisis intervention, consultation and referral.
- 532 Current Issues in School Counseling II** 3 Course Prerequisite: COUN PSY 531. Additional coverage of contemporary issues of concern to school counselors; comprehensive developmental school programs, school community dynamics, parental involvement, consultation.
- 533 Master's Internship in Community Counseling** 4 May be repeated for credit; cumulative maximum 16 hours. Course Prerequisite: COUN PSY 512; COUN PSY 513 or concurrent enrollment; COUN PSY 515 or concurrent enrollment. Supervised experience in the application of counseling theory and techniques in an agency setting. S, F grading.
- 535 Master's Internship in School Counseling** 4 May be repeated for credit; cumulative maximum 16 hours. Course Prerequisite: COUN PSY 512; COUN PSY 513 or concurrent enrollment; COUN PSY 515 or concurrent enrollment. Supervised experience in the application of guidance and counseling theory and techniques in a school setting. S, F grading.
- 537 Professional Development in Counseling Psychology** 3 NBCC requirements; growth and development, social and cultural foundations, the helping relationship, group dynamics, career, appraisal and research.
- 541 Clinical and Experimental Hypnosis Seminar** 3 Course Prerequisite: Student in counseling, educational, experimental, or clinical psychology. Clinical and experimental hypnosis, emphasizing applied research and clinical methods. Cooperative: Open to UI degree-seeking students.
- 542 Cross-cultural Research in Counseling and Assessment** 3 Cross-cultural research methods, concepts, and findings in counseling and assessment.
- 551 Doctoral Practicum in Counseling Psychology I** 4 (2-6) Course Prerequisite: Admission to Counseling Psychology PhD program; COUN PSY 512; COUN PSY 513 or concurrent enrollment; COUN PSY 515 or concurrent enrollment; COUN PSY 517 or concurrent enrollment. Supervised experiences in the application of counseling psychology theory and techniques. S, F grading.
- 552 Doctoral Practicum in Counseling Psychology II** 4 (2-6) Course Prerequisite: COUN PSY 551. Supervised experiences in the application of counseling psychology theory and techniques. S, F grading.
- 553 Doctoral Practicum in Counseling Psychology III** 4 (3-3) May be repeated for credit; cumulative maximum 16 hours. Course Prerequisite: COUN PSY 552. Supervised experiences in the application of counseling psychology theory and techniques. S, F grading.
- 561 Continuing Counseling ESA Certification** V 2-6 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Initial Counselor Certification; equivalent of 180 full days of school counselor experience; by department consent only. Peer review requirements for continuing level ESA Counselor Certification.
- 590 Seminar in Research in Counseling Psychology** 3 Course Prerequisite: COUN PSY 512; COUN PSY 515; COUN PSY 527; ED RES 565; ED PSYCH 568. Recent developments in counseling psychology research and design applied to PhD dissertation proposals. S, F grading.
- 596 Pet Loss and Human Bereavement** 1 Addresses human bereavement and grief in the context of the human/animal relationship.
- 597 Counseling Psychology Internship** V 2-4 May be repeated for credit; cumulative maximum 8 hours. Supervised internship experience, individual and group counseling, evaluation, assessment, supervision, and teaching. S, F grading.
- 600 Special Projects or Independent Study** V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination** V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 702 Master's Special Problems, Directed Study, and/or Examination** V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.
- 800 Doctoral Research, Dissertation, and/or Examination** V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Counseling Psychology PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

EDUCATIONAL ADMINISTRATION AND SUPERVISION

ED AD

- 501 Philosophy of Education** 3 Development of American educational philosophy.
- 503 Values and Ethics for Educational Leaders** 3 Study of ethical theories, the moral dilemmas of public schooling, and the skills of ethical reasoning; professional code of ethics.
- 506 Social Context of Education** 2 The interpretation of social context issues including historical, legal and cultural factors as these influence policies and practice in education.
- 507 Social Foundations of Education** 3 Educational adaptations to the economic and social trends and forces.
- 510 Improvement of Instruction** 3 Analysis and evaluation of instructional models with emphasis on information processing; implications for changing teaching style.
- 512 Leadership Studies for Social Justice** 3 Leadership theories and approaches including present educational problems, leadership theories, and perspectives.
- 513 Organizational Behavior** 3 Human behavior within various social and cultural organizational settings.
- 514 Basic Principles of Curriculum Design** 3 The application of theoretical concepts and approaches in the planning and design of curricula.
- 515 Curriculum Implementation** 3 Research and practice; innovation and change in curricular organization emphasizing implementation.
- 516 Instructional and Curricular Leadership** V 2-3 Theory, research, and practice of providing instructional and curricular leadership in schools and other educational settings.
- 518 Media Literacy and Educational Technology** 3 Relates research and theory of media literacy to instructional resources and current leadership practices; problems of planning and administering programs.

- 520 Seminar in Curriculum and Instruction V** 2-3 Contemporary issues, analyses and developments of educational programs.
- 521 Topics in Education V** 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and/or applications in selected areas of education.
- 522 Topics in Education V** 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and / or applications in selected areas of education.
- 531 Special Topics 1** May be repeated for credit; cumulative maximum 3 hours. Topical issues in education responding to shifting demands and skills needed by parents, teachers, school administrators and community leaders.
- 532 Special Topics 1** May be repeated for credit; cumulative maximum 3 hours. Topical issues in education responding to shifting demands and skills needed by parents, teachers, school administrators and community leaders.
- 534 Special Topics 1** May be repeated for credit; cumulative maximum 3 hours. Topical issues in education responding to shifting demands and skills needed by parents, teachers, school administrators and community leaders.
- 536 Introduction to Qualitative Research in Education 3** Course Prerequisite: ED PSYCH 505 or ED RES 563. Introduction to the theory and methods of qualitative research; field relations, data collections, data analysis, hypothesis development, and theory generation.
- 537 Advanced Qualitative Research in Education 3** Course Prerequisite: ED RES 564 or ED AD 536. Advanced theory and methods of qualitative research; theoretical foundations, data collection and analysis, and reporting.
- 538 Special Topics in Qualitative Research in Education V** 1-3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: ED RES 564 or ED AD 536.
- 539 Applied Research for Educational Leaders 3** Integrates the principles, skills, and tools of research into the leadership and managerial practices of educational leaders.
- 560 Student Personnel Services in Higher Education V** 2-3 Philosophy, structure, functions, and organization of student affairs administration.
- 561 Introduction to College Student Development 3** Student development theory, related research and the application of theory to practice in student affairs work.
- 562 Professional Issues in Student Affairs Administration 3** Course Prerequisite: ED AD 560; ED AD 561. The organization, programs and professional issues related to selected student affairs programs and units.
- 563 Research in College Student Development 3** Course Prerequisite: ED AD 561; admission to EdD program. Critique, understand, and apply college social identity models as they relate to teaching, advising, and working with diverse student populations.
- 565 Practicum in Higher Education 3** (0-9) Course Prerequisite: Graduate student with 15 hours of completed course work in TCH LRN, ED AD, ED PSYCH, or ED RES courses. Selected supervised experiences in general higher education and student affairs settings provide for the investigation/application of theory/methods gained through formal course work.
- 567 Diversity in Higher Education 3** Reflection on experience and examination of the theory of practice or organizational leadership in the context of diversity.
- 568 Finance and Budgeting in Higher Education 3** Course Prerequisite: By instructor permission. Exposes students to the fundamentals of higher education budgeting and finance.
- 570 Community and Technical Colleges 3** For teachers and administrators. Development and function of community and technical colleges.
- 571 College Teaching 3** Concepts, principles, issues, and procedures in college curriculum development, and college teaching.
- 572 History of Higher Education 3** History, philosophy, objectives, and issues of colleges and universities as social institutions.
- 573 Issues in Higher Education 3** Selected contemporary issues in higher education.
- 578 Higher Education Law and Ethics 3** Legal and ethical aspects of higher education with special reference to administrators, faculty, and students in higher education institutions.
- 579 Administration of Higher Education 3** Organization, administration and leadership of universities, colleges, and community colleges.
- 580 School Organization and Administration 3** Readings and discussions on the theories and practices of school organization and administration. Cooperative: Open to UI degree-seeking students.
- 581 Politics in Education 3** Examining the intrapersonal, organizational politics and political dilemma, particularly as they pertain to marginalized groups.
- 582 Policy Formation and Analysis in Education 3** Political and organizational policy formation processes in educational organizations; policy analysis in education.
- 583 Community and Communications 3** Social, political, and economic relationships between education and the community; methods of public polling and campaign strategy techniques.
- 584 Human Resource Management 3** Human relations in education; problems involved and practical solutions considered.
- 585 Financial Management in Education 3** Economics and financing of education; financial planning, budget development, investment analysis, bonding, cost effectiveness; current trends in educational finance. Cooperative: Open to UI degree-seeking students.
- 587 Seminar in School Administration V** 1-6 May be repeated for credit; cumulative maximum 6 hours. Interdisciplinary seminars; related studies; discussions in several areas by specialists.
- 588 The Law and Education 3** Fundamental legal principles within which public education functions; applicable school codes of Washington and other states; review important court cases.
- 589 Leadership Development Seminar 3** Improving knowledge and skills in strategic planning, decision making, leadership issues, conflict, motivation, staff development, productivity, and stress.
- 590 Internship V** 1-6 May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: By interview only. Internship in professional positions. S, F grading.
- 596 Preparing Grant Proposals 3** Identification of funding sources; analysis, evaluation, and production of grant proposals.
- 600 Special Projects or Independent Study V** 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination V** 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 702 Master's Special Problems, Directed Study, and/or Examination V** 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.
- 800 Doctoral Research, Dissertation, and/or Examination V** 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Educational Leadership PhD or EdD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

EDUCATIONAL PSYCHOLOGY

ED PSYCH

- 400 Quantitative Reasoning in Education 3** Course Prerequisite: MATH 220 or STAT 360. Introductory course for data-driven decisions using quantitative reasoning.

- 401 Classroom Assessment, Elementary** V 2-3 Course Prerequisite: TCH LRN 301. Principles and practice of high-quality classroom assessment in the elementary schools.
- 404 Large-Scale Synthesis of Social Science Data** 3 Practical and methodological understandings of and ability to analyze and synthesize large-scale data; presentation and communication of results from synthesized large-scale data.
- 468 Classroom Assessment, Secondary** 3 Principles and practice of high-quality classroom assessment in secondary schools.
- 502 Theoretical Foundations of Learning and Instruction** 3 Historical and contemporary theories of learning and instruction; application of theory in counseling and teaching settings.
- 503 Advanced Educational Psychology** 3 Contemporary theories, models, and empirical research in educational psychology.
- 504 Classroom-focused Research Methods** 2 Methods, design, implementation, and application of results in classroom context.
- 505 Research Methods I** 3 Research methods; literature review; design, implementation, and interpretation of results.
- 508 Educational Statistics** 3 Introductory course for graduate students in applied statistics for the behavioral sciences. Recommended preparation: ED PSYCH 505. Cooperative: Open to UI degree-seeking students.
- 509 Educational Measurements: Test Development and Assessment** V 2-3 Theory and use of standardized educational measurement instruments; intelligence, aptitude, and achievement tests; measurement of outcomes.
- 510 Assessment of Learning** 3 Assessment of student learning, school and district evaluation; particularly appropriate for school administrators.
- 511 Classical and Modern Test Theory** 3 Course Prerequisite: ED PSYCH 508; ED PSYCH 509. Large-scale educational assessment and test development and evaluation; history and policy uses of achievement tests.
- 521 Topics in Educational Psychology** V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and/or applications in selected areas of educational psychology.
- 563 Principles of Research** 3 Course Prerequisite: COUN PSY 501, ED RES 562, or admission to EdD program. The centrality of literature review and the understanding of methods used in educational research; practice in designing research questions. (Crosslisted course offered as ED RES 563, ED PSYCH 563).
- 564 Qualitative Research** 3 Course Prerequisite: ED RES 563. Theoretical underpinnings of qualitative research; familiarity with published qualitative research in education; practical research skills. (Crosslisted course offered as ED RES 564, ED PSYCH 564).
- 565 Quantitative Research** 3 Course Prerequisite: ED PSYCH 508; ED RES 563. Statistical literacy in educational research; parametric and non-parametric methods. (Crosslisted course offered as ED RES 565, ED PSYCH 565).
- 568 Quasi-Experimental Design** 3 Course Prerequisite: ED PSYCH 505 or ED RES 563; ED RES 565. Integration and application of research skills in writing proposals, dissertations, papers for publication; interpreting, critiquing, and synthesizing research studies.
- 569 Seminar in Quantitative Techniques in Education** V 2-3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: ED RES 565. Application of parametric and nonparametric statistics, data processing using computer packages in educational research.
- 570 Introduction to Program Evaluation** 3 Course Prerequisite: ED PSYCH 505 or ED RES 563. Introduction to strategies and techniques for evaluation of educational and social programs.
- 571 Theoretical Foundations and Fundamental Issues in Program Evaluation** 3 Course Prerequisite: ED PSYCH 570. Examine the history of the field, the ideas and practices of theorists who formed the field and how their work has influenced program evaluation.
- 572 Introduction to Systematic Literature Reviews and Meta-Analyses** 3 Course Prerequisite: ED PSYCH 505 or 508. Introduction to the steps involved in conducting systematic reviews and meta-analyses.
- 573 Motivation Theories** 3 Antecedents, consequences, and processes of motivated behavior examined from theoretical, empirical, and applied perspectives.
- 574 Seminar in Educational Psychology** 1 May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: Graduate student in Educational Psychology. Reading and discussion of papers in the educational psychology literature and the presentation of student's work.
- 575 Multilevel Modeling** 3 Course Prerequisite: ED PSYCH 565. Introduction to multilevel modeling techniques; examines the use of these techniques in the social sciences. Recommended preparation: ED PSYCH 569.
- 576 Factor Analytic Procedures** 3 Course Prerequisite: ED PSYCH 565. Introduction to factor analytic techniques; examines the use of factor analysis in the social sciences. Recommended preparation: ED PSYCH 569.
- 577 Item Response Theory** 3 Course Prerequisite: ED PSYCH 511. Introduction to item response theory and its use in the social sciences.
- 597 Educational Psychology Internship** V 2-4 May be repeated for credit; cumulative maximum 8 hours. Supervised internship experience in educational psychology, measurement and evaluation. S, F grading.
- 600 Special Projects or Independent Study** V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination** V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 702 Master's Special Problems, Directed Study, and/or Examination** V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.
- 800 Doctoral Research, Dissertation, and/or Examination** V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Educational Psychology PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

EDUCATIONAL RESEARCH

ED RES

- 562 Epistemology, Inquiry, and Representation** 3 Course Prerequisite: Doctoral standing in education; ED PSYCH 505 or concurrent enrollment. Epistemological assumptions and methodological strategies of research.
- 563 Principles of Research** 3 Course Prerequisite: COUN PSY 501, ED RES 562, or admission to EdD program. The centrality of literature review and the understanding of methods used in educational research; practice in designing research questions. (Crosslisted course offered as ED RES 563, ED PSYCH 563).
- 564 Qualitative Research** 3 Course Prerequisite: ED RES 563. Theoretical underpinnings of qualitative research; familiarity with published qualitative research in education; practical research skills. (Crosslisted course offered as ED RES 564, ED PSYCH 564).
- 565 Quantitative Research** 3 Course Prerequisite: ED PSYCH 508; ED RES 563. Statistical literacy in educational research; parametric and non-parametric methods. (Crosslisted course offered as ED RES 565, ED PSYCH 565).
- 566 Research Seminar** 1 May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: Doctoral standing in Education. Presentation and analysis of research; professional development in research presentation. S, F grading.

- 567 Discourse Analysis** 3 Course Prerequisite: ED RES 562; ED RES 564. Examination of and preparation for discourse analysis research approach.
- 568 Critical Ethnography** 3 Course Prerequisite: ED RES 562; ED RES 564. In-depth focus on issues in qualitative research and ethnography and critical ethnography.
- 569 Arts-Informed Perspectives in Educational Research** 3 Course Prerequisite: ED RES 562; ED RES 564. Exploration and application of alternative forms of qualitative research and representation through the arts.
- 570 Action Research** 3 Philosophical assumptions and methodological strategies of action research; theoretical and practical foundations for conducting action research studies in schools and other organizations.
- 571 Doctoral Dissertation Preparation** 3 Conceptualization and development of a structured dissertation prospectus; socializes students to academic culture.
- 572 Survey Design and Development Research Methods** 3 Course Prerequisite: ED PSYCH 508. Introduction to survey and questionnaire design and research techniques.
- KINESIOLOGY**
- KINES**
- 138 Introduction to Kinesiology** 1 Overview of various disciplines of kinesiology, associated degrees, and careers; provides strategies for academic and professional development, including advising procedures. S, F grading.
- 199 Human Motor Development** 3 Course Prerequisite: A minimum ALEKS math placement score of 40%, or MATH 103 with a C or better, or credit for or concurrent enrollment in MATH 105, 106, 108, 140, 171, 201, 202, STAT 205, or 212. Development and performance of human motor patterns; understanding of motor development; observation and analysis of foundations of movement.
- 262 Human Anatomy** 4 (3-3) Course Prerequisite: A minimum ALEKS math placement score of 40%, or MATH 103 with a C or better, or credit for or concurrent enrollment in MATH 105, 106, 108, 140, 171, 201, 202, STAT 205, or 212. Comprehensive survey of the structure and organization of the human body; emphasis on skeletomuscular, cardiovascular, nervous, and respiratory systems. Cooperative: Open to UI degree-seeking students.
- 263 Emergency Response** 2 (1-3) Course Prerequisite: Limited enrollment to those with fewer than 60 credits. First aid and safety procedures, including CPR for the Professional Rescuer, AED training and prevention training.
- 264 Fitness Concepts** 3 (2-3) Physiological, mechanical, and health-related basis of fitness practices.
- 266 Care and Prevention of Athletic Injuries** 3 Course Prerequisite: BIOLOGY 315 with a C or better or concurrent enrollment, or KINES 262 with a C or better or concurrent enrollment. Prevention, recognition, and management of common sport related injuries and illnesses.
- 267 Techniques in Athletic Injuries** 3 Course Prerequisite: Limited enrollment to those with fewer than 60 credits. Applied clinical approach to basic skills commonly used in the field of athletic training.
- 270 Examination for Lower Extremity in Athletic Training** 3 Course Prerequisite: KINES 262 with a C or better; KINES 263 with a C or better; KINES 266 with a C or better; KINES 267 with a C or better; instructor permission. In-depth study of the lower extremities including physical examination, injury recognition, treatment, taping, bracing and rehabilitation.
- 271 Examination for Upper Extremity in Athletic Training** 3 Course Prerequisite: KINES 270 with a C or better. In-depth study of the upper extremities including physical examination, injury recognition, treatment, taping, bracing and rehabilitation.
- 275 Athletic Training Modalities** 3 Course Prerequisite: KINES 270 with a C or better. Advanced theory and techniques of modality use in athletic training.
- 291 Athletic Training Clinical Internship I** 2 May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: KINES 262 with a C or better; KINES 263 with a C or better; KINES 266 with a C or better; KINES 267 with a C or better; instructor permission. Beginning techniques in management of sport injury/illness under supervision of a certified athletic trainer.
- 305 Nutrition Related to Fitness and Sport** 3 Course Prerequisite: BIOLOGY 140 with a C or better, or 233 with a C or better; certified major in Athletic Training, Health and Fitness, Movement Studies, or Sport Science. Identification of energy, nutrient, and fluid requirements during exercise; evaluation of dietary regimens for competition, and healthy weight maintenance.
- 311 Strength Training** 3 Course Prerequisite: BIOLOGY 315 with a C or better, or KINES 262 with a C or better; KINES 264 with a C or better; certified major in Athletic Training, Health and Fitness, Movement Studies, or Sport Science. Basic information and guidelines for enhancement of athletic performance, injury prevention, rehabilitation and general fitness.
- 312 [M] Research and Assessment in Kinesiology** 3 (2-3) Course Prerequisite: STAT 212 with a C or better, STAT 401 with a C or better, or PSYCH 311 with a C or better; certified major in Athletic Training, Health and Fitness, Movement Studies, or Sport Science. Introduction to common quantitative and qualitative research methods used in the discipline; research project.
- 313 Psychological Aspects of Physical Movement** 3 Course Prerequisite: PSYCH 105 with a C or better, or SOC 101 with a C or better; certified major in Athletic Training, Health and Fitness, Movement Studies, or Sport Science. Social and psychological factors related to participation and performance on physical activity (e.g., sport, exercise, recreation, rehabilitation).
- 314 Philosophical Dimensions of Human Movement** 3 Course Prerequisite: Certified major in Athletic Training, Health and Fitness, Movement Studies, or Sport Science. The philosophical dimensions of human movement.
- 361 Health and Wellness** 3 Course Prerequisite: Certified major in Athletic Training, Health and Fitness, Movement Studies, or Sport Science. Knowledge of the multi-dimensional aspects of wellness and concepts necessary for a positive lifestyle through self-assessment.
- 362 (462) Qualitative Biomechanics** 3 Course Prerequisite: C or better in BIOLOGY 315 or KINES 262; C or better in STAT 212, STAT 401, or PSYCH 311; certified major in Athletic Training, Health and Fitness, Movement Studies, or Sport Science. Qualitative analysis of human movement in everyday activities; introduction to physics principles and how they contribute to functional movements.
- 364 Athletic Training Rehabilitation** 3 Course Prerequisite: KINES 365 with a C or better. Advanced injury rehabilitation theory and techniques in athletic training.
- 365 General Medical Aspects in Athletic Training** 3 Course Prerequisite: KINES 271 with a C or better; KINES 275 with a C or better. Current medical issues pertaining to athletic training including sport pharmacology, physiological considerations, common illnesses and special concerns.
- 380 Introduction to Exercise Physiology** 3 Course Prerequisite: BIOLOGY 251 with a C or better; certified major in Athletic Training, Health and Fitness, Movement Studies, or Sport Science. Introduction to exercise physiology as it relates to sport, physical training, and performance.
- 390 Sport Science Practicum or Research** V 1 (0-3) to 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: KINES 264 with a C or better; certified in Sport Science, Athletic Training, or Health and Fitness programs. Supervised practicum or research. S, F grading.
- 391 Practicum in Physical Education** V 1-4 May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: By interview only. Supervised practicum. S, F grading.
- 392 Athletic Training Clinical Internship II** 2 (1-3) May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: KINES 271 with a C or better; KINES 275 with a C or better. Intermediate techniques in management of sport injury/illness under supervision of a certified athletic trainer.

- 393 Practicum in Special Populations V** 1 (0-3) to 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. Supervised practicum. S, F grading.
- 411 Advanced Strength Training** 3 Course Prerequisite: BIOLOGY 315 with a C or better or KINES 262 with a C or better; KINES 264 with a C or better; KINES 311 with a C or better. Advanced strength training, including an in-depth look at programming of strength and fitness programs.
- 412 Strength Training Practicum I** 3 (1-8) Course Prerequisite: BIOLOGY 315 or KINES 262 each with a C or better; KINES 264 with a C or better; KINES 311 with a C or better; KINES 411 with a C or better or concurrent enrollment; certified Strength and Conditioning minor; current CPR/First Aid. Clinical experience within the Strength and Conditioning minor, focusing on the basics of lifting and spotting techniques.
- 413 Strength Training Practicum II** 3 (1-3) Course Prerequisite: KINES 411 with a C or better; KINES 412 with a C or better; certified Strength and Conditioning minor; current CPR/First Aid certification. Clinical experience within the Strength and Conditioning minor, focusing on plyometrics and power techniques for clients needing alterations in workouts.
- 414 Strength Training Practicum III** 3 (1-8) Course Prerequisite: KINES 413 with a C or better; certified Strength and Conditioning minor; current CPR/First Aid certification. Clinical experience within the Strength and Conditioning minor focusing on preparation for the NSCA certification exam.
- 415 Kinesiology Capstone** 3 Course Prerequisite: KINES 312 with a C or better; Certified major in Athletic Training, Health and Fitness, Movement Studies or Sport Science; junior standing. Culminating experience for Kinesiology students to integrate and apply content methods through a research/practical project or experience.
- 461 [M] Motor Learning and Control** 3 Course Prerequisite: BIOLOGY 251 with a C or better; BIOLOGY 315 with a C or better, or KINES 262 with a C or better; certified major in Athletic Training, Health and Fitness, Movement Studies, or Sport Science; completion of writing portfolio. Motor learning and motor control areas; neural mechanisms, practice, feedback, retention, and transfer application of theoretical concepts.
- 469 [M] Athletic Training Organization and Administration** 3 Course Prerequisite: KINES 364 with C or better. The organization and administration of athletic training programs.
- 470 Psychosocial Issues for Athletic Training** 3 Course Prerequisite: KINES 365 with a C or better. An advanced look at psychology and its application in working with an athletic population.
- 481 Health Education Methods** 3 Course Prerequisite: KINES 361 with C or better; TCH LRN 464 with C or better, or concurrent enrollment; TCH LRN 465 with C or better, or concurrent enrollment; certified elementary or secondary education major; junior standing. Basic principles, theory, and practices of public school health education teaching methods for K-12 public school pre-service teachers.
- 483 Fitness Education Methods** 3 (2-3) Course Prerequisite: TCH LRN 464 with C or better, or concurrent enrollment; TCH LRN 465 with C or better, or concurrent enrollment; certified elementary or secondary education major; junior standing. Basic principles, theory, and practices of public school physical education teaching methods for K-12 public school pre-service teachers.
- 484 [CAPS] Exercise Prescription and Medical Conditions** 3 Course Prerequisite: BIOLOGY 315 with a C or better, or KINES 262 with a C or better; BIOLOGY 251 with a C or better; certified major in Athletic Training, Health and Fitness, Movement Studies, or Sport Science; junior standing. An integrated culmination of the knowledge, understanding, and skills for teaching movement activities to individuals with medical conditions.
- 485 Kinesiology Internship** V 10-12 Course Prerequisite: Certified major in Sport Science; completed with a C or better all course work for the Sport Science major; completion of all UCORE requirements. Supervised practicum in fitness or health agency or business. KINES 485 cannot be taken concurrently with other coursework. Students must comply with all internship policies and procedures. S, F grading.
- 490 Instructional Practicum** V 1-4 May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 493 Athletic Training Clinical Internship III** 2 May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: KINES 364 with a C or better. Advanced techniques in management of sport injury/illness under supervision of a certified athletic trainer.
- 496 Special Topics** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Special topics in physical education, health, fitness, or sport.
- 499 Special Problems** V 1-4 May be repeated for credit; cumulative maximum 6 hours. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 586 Methods of Health and Physical Education** 2 Physical activity and health promotion for school programs, and educational/legal issues on physical and sexual abuse, K-8.

SPORT MANAGEMENT

The general prerequisite for enrollment in 300 and 400-level sport management courses is 60 hours of coursework and certification as a sport management major or sport management minor. Students of junior or senior status in a certified major who require a 300 or 400-level sports management course for their program will be allowed to enroll in the required course. Additional prerequisites for specific courses are listed in the course descriptions. The program director must approve any exceptions to these requirements.

SPMGT

- 101 [DIVR] Sport and Popular Culture: Trends and Issues** 3 Explores how sport shapes or reinforces cultural and social values and ideologies.
- 276 Introduction of Sport Management** 3 Course Prerequisite: ENGLISH 101 or 298 with a C or better; COM 102 with a C or better; MATH [QUAN] UCORE with a C or better; 2.5 cumulative GPA. Principles and concepts in sport management; overview of sport industries and career opportunities. Not open to seniors or first-year students during their first semester.
- 290 Sport Programs** 3 (2-3) Course Prerequisite: ENGLISH 101 or 298 with a C or better; COM 102 with a C or better; MATH [QUAN] UCORE with a C or better; 2.5 cumulative GPA. Philosophies and program content of public/private sport programs; laboratory experiences in school, college, and community sport programs.
- 365 Ethics and Moral Reasoning in Sport** 3 Course Prerequisite: Certified major or minor in Sport Management; SPMGT 276; junior standing. Understanding and application of ethical theory and principles of moral reasoning to the analysis of issues and dilemmas in sport.
- 367 [M] Sport in American Society** 3 Course Prerequisite: Certified major or minor in Sport Management; SPMGT 276; junior standing. Examination of the role of sport in contemporary American society as well as the relationship between sport and other social institutions.
- 374 Sport Finance** 3 Course Prerequisite: Certified major or minor in Sport Management; SPMGT 276; junior standing. Introduction to financial analysis, budgeting and revenue acquisition for both for profit and not for profit sport organizations.
- 377 Legal Aspects of Sport** 3 Course Prerequisite: Certified major or minor in Sport Management; SPMGT 276; junior standing. Legal aspects of the supervision, management and business of sport.
- 379 Media and Communication in Sport** 3 Course Prerequisite: Certified Sport Management major or minor. Introduction to media and communication tools (video editing, new and social media, and public relations) for sport management purposes.

- 384 Global Sport Management** 3 Course Prerequisite: Certified major or minor in Sport Management. Introduction to international sport governance and overview of key characteristics of sport management on a global scale.
- 394 Practicum in Sport Management** V 1-4 May be repeated for credit; cumulative maximum 8 hours. Supervised practicum. S, F grading.
- 464 Sport Marketing** 3 Course Prerequisite: Certified major or minor in Sport Management; SPMGT 365. An examination of sport as a consumer product and as a medium by which to sell consumer products.
- 468 [M] Managing Sport Organizations** 3 Course Prerequisite: SPMGT 367; certified major in Sport Management. Analysis of management processes and structures of sport organizations.
- 488 Current Trends in Sport Management** 2 Course Prerequisite: SPMGT 367; SPMGT 377; certified major in Sport Management; senior standing. Current trends and issues; research resources; professional presentations.
- 489 Theory and Application in Sports Event Management** 3 Course Prerequisite: Certified major in Sport Management; SPMGT 468 or concurrent enrollment; senior standing. Investigation and application of the components of the sport management profession.
- 490 Internship Seminar** 1 Course Prerequisite: Certified major in Sport Management; SPMGT 365; SPMGT 367; SPMGT 377; senior standing. Overview of policies and requirements; guidance through site selection and application process; communication skills for the business/sport environment. S, F grading.
- 491 Internship** V 10-12 Course Prerequisite: Certified major in Sport Management; SPMGT 488; SPMGT 490. Supervised practicum in agency or business. S, F grading.
- 496 Special Topics** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Special topics in sports studies.
- 497 Special Topics** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Special topics in sport studies.
- 499 Special Problems** V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 521 Special Topics in Sport Management** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Admission to the Sport Management Graduate program. Recent research, developments, issues, and/or applications in selected areas of Sport Management.
- 540 Current Issues in Sport Management** 3 Solutions-oriented investigation of current issues faced by sport managers/administrators; interpretation of research literature; procedures for issue resolution.
- 564 Marketing of Sport Events and Programs** 3 Principles of sport marketing including public relations, corporate sponsorship, and service quality for sport organizations.
- 565 Ethical Perspectives of Sport and Physical Activity** 3 Ontological, ethical, aesthetic views of physical activity. Required preparation must include SPMGT 365 or equivalent.
- 567 Social and Cultural Issues of Physical Activity and Sport** 3 Sport and physical activity as cultural forms, including the examination of subcultures, stratification, socialization and power relations.
- 568 Administrative Concepts in Sport Organizations** 3 Effective management for sport programs. Analysis of dynamic management process necessary for improvement of productivity in sport organizations.
- 569 Sport in Higher Education** 3 Course Prerequisite: Admission to the Sport Management Graduate program. The course examines sport in higher education institutions from the historical, cultural, and administrative perspectives.
- 577 Law and Risk Management in the Sport Industry** 3 Use of risk management perspective to explore the law as it applies to the management concerns of sport organizations. Required preparation must include SPMGT 377 or equivalent.
- 578 Sports in Society** 3 The social significance of sports; sociology of sport research. Required preparation must include SPMGT 367 or equivalent.
- 579 Sport Media and Communication** 3 Explores and critically examines the role of media and communication in contemporary sports and society. Recommended preparation: SPMGT 379 or equivalent.
- 600 Special Projects or Independent Study** V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination** V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

702 Master's Special Problems, Directed Study, and/or Examination V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

School of Electrical Engineering and Computer Science

school.eecs.wsu.edu
EME 102
509-335-6602

Huie-Rogers Chair in Computer Science, Professor, and Director, B. Shirazi; Huie-Rogers Endowed Chair in Computer Science and Professor, D. Cook; Boeing Centennial Chair in Computer Engineering and Professor, P. Pande; Distinguished Professor in Power, A. Bose; Distinguished Professor in Electromagnetics, R. Olsen; Boeing Distinguished Professor, C. Liu; Professors, D. Bakken, S. Broschat, J. Delgado-Frias, T. Fischer, D. Heo, L. Holder, S. Hudson, M. Osman, A. Saberi, N. Schulz, V. Venkatasubramanian, K. Wang; Associate Professors, B. Belzer, Z. Dang, C. Hundhausen, S. Ji, A. Kalyanaraman, R. Lewis, J. Miller, P. Pedrow, S. Roy, J. Schneider, K. Sivakumar, A. Srivastava; Assistant Professors, V. Arnaoudova, H. Cai, J. Doppa, A. Dubey, A. Gebremedhin, H. Ghasemzadeh, S. Gupta, A. Hahn, D. Kim, S. Lotfifard, A. Mehrizi-Sani, L. Tan, M. Taylor, Y. Wu; Clinical Professor, A. Kakar; Clinical Associate Professors, A. Abu-Hajar, C. Hauser, M. Kejarawal, A. O'Fallon, R. Rioux; Clinical Assistant Professors, S. Arslan Ay, A. Carter, J. Murray, E. Olds, B. Zeng; Instructors, B. Carper, C. Cole, T. Hanshaw, D. Mair, S. Mazroue, G. Sprint, M. Xue; Professors Emeriti, G. Hower, G. LaRue (Associate), C. Mosher, J. Ringo.

The School of Electrical Engineering and Computer Science offers courses of study leading to the degrees of Bachelor of Science in Electrical Engineering (BSEE), Computer Engineering (BSCptE), or Computer Science (BSCptS), Bachelor of Arts in Computer Science (BACptS), Master of Science in Electrical Engineering (MSEE), Computer Engineering (MSCptE), or Computer Science (MSCptS), Doctor of Philosophy in Electrical and Computer Engineering, and Doctor of Philosophy in Computer Science. The undergraduate programs are accredited by ABET, 111 Market Pl, Ste. 1050, Baltimore, MD 21202-4012, (410) 347-7700. In collaboration with the Department of Mathematics and Statistics, a new, interdisciplinary degree leading to the Bachelor of Science in Data Analytics is also available (see Mathematics and Statistics for complete information).

Electrical Engineering

The curriculum in electrical engineering is designed to give the student fundamental knowledge in the areas of general interest to all electrical engineers. The course of study is therefore oriented toward the basic theory and concepts which prepare students for entry into

any of the many activities open to members of the profession including research, design, development, operations, management, teaching, sales, and consulting. Laboratory experience is emphasized to provide for familiarity with electrical, electronic and computing equipment and with experimental techniques. Modern laboratories are available for electrical circuits, electronics, power systems, wireless communications and computers. Students are exposed to a variety of up-to-date computing environments to aid in their studies.

The curriculum is designed so that the equivalent of the first three to four semesters may be transferred from community colleges with minimal difficulty. The additional basic material common to all branches of electrical engineering is concentrated in the junior year, and maximum flexibility is permitted in the senior year, allowing the student to develop a breadth of interest or to select an area of specialty. The program offers a two-semester senior design project that typically involves industry cooperation, and provides students with valuable experience in applying their skills to solve real-world problems.

The educational objectives for the BSEE program are to prepare graduates: 1) for a career in the field of electrical engineering by offering a curriculum based on the principles of mathematics, science, fundamentals of engineering design and analysis, and professional ethics; 2) to use state-of-the-art technologies and tools to solve problems relevant to societal and economic needs; 3) to work and live in a global, diversified society, instilling the value of life-long learning; 4) to meet the needs of industry for electrical engineering or to pursue graduate studies; and 5) to communicate clearly and work effectively in teams.

Students graduating with the BSEE degree in electrical engineering have: a) an ability to apply knowledge of mathematics, science and engineering; b) an ability to design and conduct experiments as well as analyze and interpret data; c) an ability to design a system, component, or process to meet desired needs; d) an ability to function on multidisciplinary teams; e) an ability to identify, formulate, and solve engineering problems; f) an understanding of professional and ethical responsibility; g) an ability to communicate effectively in written and oral formats; h) a broad education necessary to understand the impact of engineering solutions in global, economic, and societal context; i) a recognition of the need for, and the ability to engage in, life-long learning; j) a broad education and knowledge of contemporary issues; and k) an ability to use techniques, skills and modern engineering tools necessary for engineering practices.

Computer Engineering

Computer engineering is a field of study that encompasses the fundamental principles, methods, and modern tools for the design and implementation of computing systems. Advances in technology are yielding smaller and higher-performing computer systems that appear in various applications, including communication systems, consumer products, and household appliances to name just a few. The computer engineering program provides a balanced perspective of both hardware and software elements of computing systems, and of their relative design trade-offs and applications. Computer engineering builds upon fundamental

courses in mathematics, science, and the engineering disciplines to achieve a sound knowledge foundation and to develop breadth. Laboratory experiences are emphasized to provide students with background on experimental design and simulation techniques. Since core course sequences are completed in the junior year, students are able to pursue their career objectives with opportunities to select from a broad range of elective courses. These include computer engineering topics such as hardware design, VLSI design, embedded systems, computer architecture, networking, and operating systems.

The program culminates with a two-semester senior design project. The project involves industry cooperation and provides students with a major design experience addressing a broad range of issues, including technical subjects as well as economics, safety, and ethical and societal considerations.

The educational objectives of the degree program in Computer Engineering are to prepare students: 1) for a career in the field of computer engineering by offering a curriculum based on the principles of mathematics, science, fundamentals of engineering design and analysis, and professional ethics; 2) to use computer systems and state-of-the-art technologies and tools to solve problems relevant to societal and economic needs; 3) to work and live in a global, diversified society, instilling the value of life-long learning; 4) to meet the needs of industry for computer engineering or to pursue graduate studies; and 5) to communicate clearly and work effectively in teams.

In order to achieve the educational objectives our students will have acquired the following skill and knowledge outcomes by the time of graduation: a) an ability to apply knowledge of mathematics, science and engineering; b) an ability to design and conduct experiments as well as analyze and interpret data; c) an ability to design a system, component, or process to meet desired needs; d) an ability to function on multidisciplinary teams; e) an ability to identify, formulate, and solve engineering problems; f) an understanding of professional and ethical responsibility; g) an ability to communicate effectively in written and oral formats; h) a broad education necessary to understand the impact of engineering solutions in global, economic, and societal context; i) a recognition of the need for, and the ability to engage in, life-long learning; j) a broad education and knowledge of contemporary issues; and k) an ability to use techniques, skills and modern engineering tools necessary for engineering practices.

Computer Science

Computer science is a discipline that provides a scientific foundation for computing expertise and skills. The curriculum is geared to provide the fundamental computing concepts derived from mathematics and sciences, and the practical application of these concepts through substantial hands-on course project experiences. The coursework in computer science prepares students for a variety of careers that involve the extensive use of computers.

There are two major degrees offered within Computer Science: the BS in Computer Science, and the BA in Computer Science. Graduates in both the degree programs will have a solid technical background in mathematics and sciences. The BS degree requires substantial basic and advanced computer science course work and is the traditional computer science degree. The BA degree is designed

for multi-disciplinary students who wish to learn the basics of computer science and apply it to a different field. A minor in another area, such as art, biochemistry, music, psychology, architecture, etc., is strongly encouraged.

The program offers courses in a wide variety of topics including theory of computation, design and analysis of algorithms, software engineering, operating systems, computer networks, computer graphics, image processing, distributed systems, and database systems. The coursework is supplemented by several general purpose computing labs dedicated to computer science students, and specialized labs for courses such as operating systems, software engineering, and computer networking. Option area course sequences allow students to specialize in specific areas such as computer graphics, computer networking, computer systems software, software engineering, or computer engineering.

The educational objectives of the degree programs in Computer Science are to prepare students: 1) for computer science or software engineering careers by offering a curriculum based on the principles of mathematics, computer science, and professional ethics, in the case of the BS degree, or, for computer science or software engineering careers in interdisciplinary fields by offering a curriculum based on the principles of mathematics, computer science, and professional ethics as well as the foundations of a minor subject area, in the case of the BA degree; 2) to use computer systems and state-of-the-art tools and techniques to solve problems relevant to societal and economic needs; 3) to work and live in a global, diversified society, instilling the value of life-long learning; 4) to meet the needs of industry for computer scientists or to pursue graduate studies; 5) to communicate clearly in oral and written forms; and 6) to work in teams.

In order to achieve the educational objectives our students will have acquired the following skill and knowledge outcomes by the time of graduation: a) an ability to apply knowledge of computing and mathematics appropriate to the discipline; b) an ability to analyze a problem, and identify and define the computing requirements appropriate to its solution; c) an ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs; d) an ability to function effectively on teams to accomplish a common goal; e) an understanding of professional, ethical, legal, security, and social issues and responsibilities; f) an ability to communicate effectively; g) an ability to analyze the local and global impact of computing on individuals, organizations, and society; h) a recognition of the need for, and an ability to engage in, lifelong learning; i) an ability to use current techniques, skills, and tools necessary for computing practice; j) an ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs in design choices; k) an ability to apply design and development principles in the construction of software systems of varying complexity.

Data Analytics

A new, interdisciplinary undergraduate degree in data analytics is also available. See the Department of Mathematics and Statistics for complete information.

Certification

Students interested in majoring in any of the school's bachelor degree programs should apply for certification as early as possible in their studies after completion of the respective courses listed under in the schedule of studies. Applications for certification are accepted prior to December 1 and May 1 for certification effective the following spring and fall, respectively. Qualification for initial certification, as well as continuation of certified status, will be evaluated based on several criteria including academic integrity, overall grade-point-average (GPA), and GPA in mathematics, science, and electrical engineering or computer science courses. Acceptance will be made after the current semester grades are available. Students will be notified of the decision as soon as possible.

Transfer Students

Students planning to transfer from other institutions should carefully note the sequence of courses. Transfers from community colleges should consult the information available on the Undergraduate Admission Web site or should write directly to the School of Electrical Engineering and Computer Science for specific information.

Schedules of Studies**Honors students complete the Honors College requirements which replace the UCORE requirements.****BACHELOR OF ARTS, COMPUTER SCIENCE (120 HOURS)**

Students may apply for certification into the Bachelor of Arts in Computer Science degree program after completion of the following courses with a grade of C or better and a cumulative GPA of 2.5 or higher: CPT S 121, 122, and 223, or CPT S 131, 132, and 233; MATH 201, 202, 216; PHIL 201. MATH 171, 172 may be substituted for MATH 201, 202.

No courses listed in this schedule of study may be taken on a pass/fail basis. All listed E E and CPT S courses, required electives, and prerequisites to these courses must be completed with a grade of C or better. Consult with advisor at campus of residence for alternative course sequences.

First Year

<i>First Term</i>	<i>Hours</i>
CPT S 121 or 131 ¹	4
Creative & Professional Arts [ARTS]	3
HISTORY 105 [ROOT]	3
MATH 201 ²	3
PHIL 201 [QUAN]	3

<i>Second Term</i>	<i>Hours</i>
CPT S 122 or 132 ¹	4
ENGLISH 101 [WRTG]	3
MATH 202 ²	3
MATH 216	3
Social Sciences [SSCI]	3

Second Year

<i>First Term</i>	<i>Hours</i>
CPT S 223 or 233 ¹	3
CPT S 260	3
Diversity [DIVR]	3

Minor Elective ³	3
STAT 212	4

<i>Second Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab ⁴	4
CPT S 355	3
MATH Elective ²	3
Physical Sciences [PSCI] with lab ⁴	4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
CPT S 322 [M]	3
ENGLISH 402 [WRTG] [M]	3
Minor Electives (choose two) ³	6
Science Elective (with lab) ⁴	4

<i>Second Term</i>	<i>Hours</i>
300-400-level Minor Elective ³	3
Advanced CPT S Electives (choose two) ⁵	6
CPT S 302	3
Science Elective ⁴	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
300-400-level Minor Elective ³	3
Advanced CPT S Electives (choose two) ⁵	6
CPT S 421 ⁶	3
Humanities [HUM]	3

<i>Second Term</i>	<i>Hours</i>
300-400-level Minor Elective ³	3
Advanced CPT S Electives (choose two) ⁵	6
CPT S 423 [CAPS] ⁶	3
Complete CPT S Exit Interview and Survey	

¹ Students may choose between a c/C++ (CPTS 121, 122, 223, 360) path or a Java programming (CPTS 131, 132, 233, 370) path. Students should stick to one path option. The Java track is not available in Tri Cities.

² Either math sequence below will satisfy the math requirement for this degree. Sequence B will allow a broader selection of advanced computer science electives. The course work in mathematics must total at least fifteen semester hours (including MATH 216). Sequence A: MATH 201, 202, STAT 212, and a MATH elective chosen from the following list: MATH 364, 416, or STAT 412. Sequence B: MATH 171, 172, 220, and STAT 212, or STAT 360.

³ Elective credits may include a minor program. Completion of a minor is strongly encouraged. If a minor in a science or engineering discipline is contemplated, Math Sequence B should be taken (see note 2).

⁴ Science electives: A minimum of 15 credits required. Must include a year-long sequence (two semesters including a laboratory in each semester) and two additional science courses, one of which must have a laboratory component. Electives include BIOLOGY 106, 107; CHEM 101, 102 or 105, 106; PHYSICS 101, 102 or 201, 202.

⁵ Advanced CPT S Electives: 18 credits required. At least 12 credit must be in CPT S courses and include a minimum of 6 credits of 400 or 500 level courses. The remaining 6 credits may be at the 300, 400 or 500 level in CPT S (preferred), MATH, STAT, E E, PHYSICS or another department with the approval of the EECS advisor. Students certified at Tri-Cities must include two courses from CPT 427, 440, 442, 460, 471, and 481. Consult with advisor at campus

of residence for course choices.

⁶ Consult with an advisor at campus of residence for allowed substitutions.

BACHELOR OF SCIENCE, COMPUTER SCIENCE (120 HOURS)

Students may apply for certification into the Bachelor of Science in Computer Science degree program after completion of the following courses with a grade of C or better and a cumulative GPA of 2.5 or higher: CPT S 121 and 122, or 131 and 132, MATH 171, 172, 216, PHIL 201, PHYSICS 201.

No courses listed in this schedule of study may be taken on a pass/fail basis. All listed E E and CPT S courses, required electives, and prerequisites to these courses must be completed with a grade of C or better. Consult with advisor at campus of residence for alternative course sequences.

First Year

<i>First Term</i>	<i>Hours</i>
CPT S 121 or 131 ¹	4
ENGLISH 101 [WRTG]	3
MATH 171 [QUAN]	4
PHIL 201	3

<i>Second Term</i>	<i>Hours</i>
CPT S 122 or 132 ¹	4
HISTORY 105 [ROOT]	3
MATH 172	4
MATH 216	3

Second Year

<i>First Term</i>	<i>Hours</i>
CPT S 223 or 233 ¹	3
CPT S 260	3
MATH 220	2
MATH 273 or 301	2 or 3
PHYSICS 201 [PSCI]	4

<i>Second Term</i>	<i>Hours</i>
CPT S 355	3
Creative & Professional Arts [ARTS]	3
Humanities [HUM]	3
PHYSICS 202	4
Social Sciences [SSCI] ²	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
CPT S 317	3
CPT S 322 [M]	3
CPT S 360 or 370 ¹	4
ENGLISH 402 [WRTG] [M]	3
STAT 360	3

<i>Second Term</i>	<i>Hours</i>
CPT S 302	3
CPT S 350	3
CPT S Track Elective ³	6
Diversity [DIVR]	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences with Lab [BSCI]	4
CPT S 421	3
CPT S Free Electives ⁴	6
CPT S Track Elective ³	3

<i>Second Term</i>	<i>Hours</i>
CPT S 423 [CAPS]	3
CPT S Free Electives ⁴	6
CPT S Track Electives ³	6
Complete Cpt S Exit Interview and Survey	

¹ Students may choose between a c/C++ (CPT S 121, 122, 223, 360) path or a Java programming (CPT S 131, 132, 233, 370) path. Students should remain in one path option. The Java track is not available in Tri-Cities.

² ECONS 101 or 102 recommended.

³ Tracks consist of five courses (15 credits): General Track: Required: CPT S 323 and 460; at least one course from CPT S 440, 443, and 471; at least two courses from CPT S 427, 451, 452, and 455. Software Engineering Track: Required: CPT S 323 and 422; at least three courses from CPT S 427, 443, 451, 452, 460, 481, and 483 (with departmental approval). Systems and Networking Track: Required: CPT S 455 and 460; at least three courses from CPT S 427, 452, 453, 464, 466, 483 (with departmental approval), and E E 324.

⁴ Four additional courses (12 credits) of 300- or 400-level courses in CPT S and E E courses not used as Track Electives; CE 463; E M 464; MATH 401, 420, 421; MBIOS 478; MSE 302; PHYSICS 303, and 443.

**COMPUTER ENGINEERING
(123 HOURS)**

Students may apply for certification into the Bachelor of Science in Computer Engineering degree program after completion of the following courses with a grade of C or better and a cumulative GPA of 2.5 or higher: CPT S 121 or 131; E E 214; MATH 171, 172, 216, 220, 273; PHYSICS 201.

No courses listed in this schedule of study may be taken on a pass/fail basis. All listed E E and CPT S courses, required electives, and prerequisites to these courses must be completed with a grade of C or better.

First Year

<i>First Term</i>	<i>Hours</i>
CHEM 105 [PSCI]	4
CPT S 121 or 131 ¹	4
ENGLISH 101 [WRTG]	3
MATH 171 [QUAN]	4
<i>Second Term</i>	<i>Hours</i>
CPT S 122 or 132 ¹	4
MATH 172	4
MATH 216	3
PHYSICS 201	4

Second Year

<i>First Term</i>	<i>Hours</i>
CPT S 223 or 233 ¹	3
E E 214	4
MATH 220	2
MATH 273	2
PHYSICS 202	4
<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
E E 234	4
E E 261	3
E E 262	1
HISTORY 105 [ROOT]	3

MATH 315	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
E E 311	3
E E 321	3
E E 324 [M]	4
E E 352 [M]	3
ENGLISH 402 [WRTG]	3

<i>Second Term</i>	<i>Hours</i>
Biological Sciences [BSCI]	3 or 4
CPT S 360 or 370 ¹	4
E E 334	3
Engineering Science Elective ²	3
STAT 360	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
CPT E Technical Electives ³	3
E E 415	2
ECONS 101 [SSCI] or 102 [SSCI]	3
Humanities [HUM]	3
Senior Design Elective I ⁴	3

<i>Second Term</i>	<i>Hours</i>
CPT E Technical Electives ³	6
Diversity [DIVR]	3
E E 302	3
E E 416 [CAPS] [M]	3
Complete CPT E Exit Interview and Survey	

¹ Students may choose between a c/C++ (CPT S 121, 122, 223, 360) path or a Java programming (CPT S 131, 132, 233, 370) path. Students should remain in one path option. The Java track is not available in Tri-Cities.

² Engineering Science Elective: Choose from E E 331, 341, ME 301, or MSE 302. (Note: If either E E 331 or E E 341 is taken as an engineering science elective, it cannot also count as a technical elective.)

³ Technical electives must be 300-400-level courses and must be chosen with an advisor's approval. Any of the following courses may be chosen to fulfill technical elective requirements: Cpt S 317, 322, 350, 355, 422, 423, 430, 440, 442, 443, 451, 452, 455, 460, 466; E E 331, 341, 351, 431, 432, 434, 451, 464, 466, 470, 476, 489, 496; One only of Math 325, 340, 364, 415, 421, 440, 441, 448, 453, 464, 466.

⁴ Senior Design Electives adhere to one of the following sequences: (1) ASIC & Digital Systems: E E 416 and 434; (2) Embedded and Microcomputer Systems: CPT S 466 and E E 416; (3) VLSI Design: E E 466 and 416.

**ELECTRICAL ENGINEERING
(123 HOURS)**

Students may apply for certification into the Bachelor of Science in Electrical Engineering degree program after completion of the following courses with a grade of C or better and a cumulative GPA of 2.5 or higher: CPT S 121 or 131; E E 214; MATH 171, 172, 220, 273; PHYSICS 201.

No courses listed in this schedule of study may be taken on a pass/fail basis. All listed E E and CPT S courses, required electives, and prerequisites to these courses must be completed with a grade of C or better.

First Year

<i>First Term</i>	<i>Hours</i>
CHEM 105 [PSCI]	4
ENGLISH 101 [WRTG]	3
ENGR 120	2
HISTORY 105 [ROOT]	3
MATH 171 [QUAN]	4

<i>Second Term</i>	<i>Hours</i>
CPT S 121 or 131	4
MATH 172	4
MATH 220	2
PHYSICS 201	4

Second Year

<i>First Term</i>	<i>Hours</i>
CPT S 122 or 132	4
E E 214	4
MATH 273	2
PHYSICS 202	4

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
E E 234	4
E E 261	3
E E 262	1
ECONS 101 [SSCI] or 102 [SSCI]	3
MATH 315	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
E E 311	3
E E 321	3
E E 331	3
E E 352 [M]	3
Engineering Science Elective ¹	3

<i>Second Term</i>	<i>Hours</i>
E E 302	3
E E 341	3
E E 361	3
MATH 360	3
Track Elective ²³	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
Diversity [DIVR]	3
E E 415	2
Engineering Science Elective ¹	3
ENGLISH 402 [WRTG]	3
Track Electives ²³	6

<i>Second Term</i>	<i>Hours</i>
300-400-level Track Electives ²³	6
Biological Sciences [BSCI]	3 or 4
E E 416 [CAPS] [M]	3
Humanities [HUM]	3
Complete E E Exit Interview and Survey	

¹ Engineering Science Electives (6 credits): Choose from CE 211, ME 212, 301, MSE 302.

² Students follow one of five tracks for an emphasis in their degree program: Power Track: required: E E 362 [M], 491, at least 6 credits from E E 486, 489, 492, 493, 494, and three credits from list of approved technical electives; Microelectronics Track: required: E E 351, 431, 476, 496, and at least one from E E 464, 489, 495; Systems Track: required:

E E 464, 489, at least one from E E 432, 451, and two from E E 351, 431, 432, 451, 470, 495; General Track: at least one from E E 324 [M], 351, 362 [M], 489, and twelve credits from list of approved technical electives with a minimum of nine credits 400-level E E courses; or Computer Engineering Track: required: E E 434, 466, at least one from E E 324 [M], 334, CPT S 360, and six credits from list of approved technical electives with a minimum of three credits 400-level E E courses.

³ Approved Technical Electives for Power Track (3 credits), General Track (12 credits - minimum 9 credits 400-level E E courses), and Computer Engineering Track (6 credits - minimum 3 credits 400-level E E courses) include: ASTRONOM 435, CE 463, CHEM 331, 333, 345, MATH 320 [M], 325, 340, 364, 401 [M], 402 [M], 415, 420, 421 [M], 440, 441, 448, 453, 464, 466, ME 401, 404, MSE 402, 403, PHYSICS 303, 304, 320, 443, 450, and 463, or any 300-400-level CPT S or E E course not used to fulfill other requirements.

SOFTWARE ENGINEERING (122 HOURS)

Students may apply for certification into the Bachelor of Science in Software Engineering degree program after completion of the following courses with a grade of C or better and a cumulative GPA of 2.5 or higher: CPT S 121 or 131, 122 or 132; MATH 171, 172, 216; PHIL 201; PHYSICS 201.

No courses listed in this schedule of study may be taken on a pass/fail basis. All listed E E and CPT S courses, required electives, and prerequisites to these courses must be completed with a grade of C or better.

First Year

First Term	Hours
CPT S 121 or CPT S 131	4
ENGLISH 101 [WRTG] or 105 [WRTG]	3
MATH 171 [QUAN]	4
PHIL 201	3

Second Term	Hours
CPT S 122 or CPT S 132	4
HISTORY 105 [ROOT]	3
MATH 172	4
MATH 216	3

Second Year

First Term	Hours
CPT S 223 or CPT S 233	3
CPT S 260	3
MATH 220	2
MATH 301	3
PHYSICS 201 [PSCI]	4

Second Term	Hours
CPT S 321	3
CPT S 355	3
Creative & Professional Arts [ARTS]	3
ECONS 101 [SSCI] or ECONS 102 [SSCI]	3
Humanities [HUM]	3

Third Year

First Term	Hours
CPT S 302	3
CPT S 317	3

CPT S 322 [M]	3
CPT S 360 or CPT S 370	4
ENGLISH 402 [WRTG] or 403 [WRTG]	3
Complete Writing Portfolio	

Second Term	Hours
Biological Science [BSCI]	3
CPT S 350	3
CPT S 451	3
CPT S 487	3
Diversity [DIVR]	3
STAT 360	3

Fourth Year

First Term	Hours
CPT S 421	3
CPT S 422 [M]	3
CPT S 455	3
CPT S 484	3
Software Engineering Option Course ¹	3

Second Term	Hours
CPT S 423 [CAPS]	3
CPT S 460, CPT S 464, or CPT S 466 ²	3
CPT S 476	3
Software Engineering Option Courses ¹	6

¹ Software Engineering Option Courses (Nine credits required): Any 400 level course in CPT S, E E, or MATH not used to fulfill major requirements. Upper-division courses in other disciplines may be used with prior approval by advisor.

² Three credits of CPT S 483 may be substituted with prior approval by advisor.

Minors

Computer Engineering

18 semester hours of computer related courses in electrical engineering are necessary to earn a minor, 9 of which must be 300-400-level taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. E E 214, 234, and 324 are required.

Computer Science

The minor in computer science consists of 20 credits which must include Cpt S 121, 122, 223, and three 300-400-level Cpt S courses excluding computer skills and literacy courses. All prerequisites for minor courses must be met. The minor program must be approved by the computer science undergraduate coordinator.

Electrical Engineering

The minor in electrical engineering consists of 18 credit hours, 9 of which must be 300-400-level and taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. The 18 credits must include the following courses: E E 214, 261, and 262. The remaining credits must be selected from any 300-400-level E E courses excluding E E 302 and E E 304. All prerequisites for minor courses must be met. The minor program must be approved by the electrical engineering undergraduate coordinator.

Description of Courses

COMPUTER SCIENCE

With the exception of the Computer Skills and Literacy courses, enrollment in 300-400-level computer science courses is restricted to certified majors or minors in computer science, computer engineering, or electrical engineering, and to juniors and seniors officially certified into other degree programs requiring these computer science courses.

CPT S

111 [QUAN] Introduction to Algorithmic Problem Solving 3 (2-3) Course Prerequisite:

MATH 101 with a C or better, MATH 103 with a C or better, or higher level MATH course with a C or better, or a minimum ALEKS math placement score of 45%. Elementary algorithmic problem solving, computational models, sequential, iterative and conditional operations, parameterized procedures, array and list structures and basic efficiency analysis.

115 Introduction to Data Analytics 3 Basic concepts, principles, and tools used in data analytics. (Crosslisted course offered as CPT S 115, CS 115, STAT 115).

121 Program Design and Development C/

C++ 4 (3-3) Course Prerequisite: MATH 108, 171, 172, 182, 201, 202, 206, or 220, each with a C or better, or a minimum ALEKS math placement score of 80%, or adequate CPT S placement test score determined by the department. Formulation of problems and top-down design of programs in a modern structured language (C/C++) for their solution on a digital computer.

122 Data Structures C/C++ 4 (3-3) Course

Prerequisite: CPT S 121 with a C or better. Advanced programming techniques: data structures, recursion, sorting and searching, and basics of algorithm analysis taught in C/C++ programming language.

131 Program Design and Development Java

4 (3-3) Course Prerequisite: Course Prerequisite: MATH 108, 171, 172, 182, 201, 202, 206, or 220, each with a C or better, or ALEKS math placement score of 80% or higher, or adequate CPT S placement test score determined by the department. Formulation of problems and top-down design of programs in a modern structured language for their solution on a digital computer. Taught in Java programming language.

132 Data Structures Java 4 (3-3) Course

Prerequisite: CPT S 131 with a C or better. Advanced programming techniques: data structures, recursion, sorting and searching, and basics of algorithm analysis. Taught in Java programming language.

215 Data Analytics Systems and Algorithms

3 Course Prerequisite: CPT S 122, CPT S 132, or CS 122. Exploration of fundamental concepts, constructs, and techniques of modern data analytics systems. (Crosslisted course offered as CPT S 215, CS 215).

- 223 Advanced Data Structures C/C++** 3 Course Prerequisite: CPT S 122 with a C or better; MATH 216 with a C or better or concurrent enrollment. Advanced data structures, object oriented programming concepts, concurrency, and program design principles taught in C/C++ programming language.
- 224 Programming Tools** 2 Course Prerequisite: CPT S 122 with a C or better. Debugging tools, scripting languages, UNIX programming tools.
- 233 Advanced Data Structures Java** 3 Course Prerequisite: CPT S 132 with a C or better; MATH 216 with a C or better or concurrent enrollment. Advanced data structures, object oriented programming concepts, concurrency, and program design principles. Taught in Java programming language.
- 260 Introduction to Computer Architecture** 3 Course Prerequisite: CPT S 223 with a C or better or concurrent enrollment. Computer systems architecture; logic, data representation, assembly language, memory organization and trends.
- 302 Professional Skills in Computing and Engineering** 3 Course prerequisite: Certified major in Computer Science, Computer Engineering, or Electrical Engineering; junior standing. Foundation in computing and engineering professional development. (Crosslisted course offered as CPT S 302, E E 302). Credit not granted for both CPT S/E E 302 and CPT S 401.
- 315 Introduction to Data Mining** 3 Course Prerequisite: CPT S 215. The process of automatically extracting valid, useful, and previously unknown information from large repositories. (Crosslisted course offered as CPT S 315, CS 315).
- 317 Automata and Formal Languages** 3 Course Prerequisite: CPT S 122 with a C or better; MATH 216 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Finite automata, regular sets, pushdown automata, context-free language, Turing machines and the halting problem.
- 321 Object-Oriented Software Principles** 3 Course Prerequisite: CPT S 223 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Object-oriented programming for flexibility, efficiency, and maintainability; logic and UI decoupling; complexity analysis, data structures, and algorithms for industry-quality software.
- 322 [M] Software Engineering Principles I** 3 Course Prerequisite: CPT S 223 with a C or better or concurrent enrollment; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Introduction to software engineering; requirements analysis, definition, specification including formal methods; prototyping; design including object and function oriented design.
- 323 Software Design** 3 Course Prerequisite: CPT S 223 with a C or better; CPT S 322 with a C or better or concurrent enrollment; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Practical aspects of software design and implementation using object-oriented, aspect-oriented and procedural programming.
- 350 Design and Analysis of Algorithms** 3 Course Prerequisite: CPT S 223 with a C or better; CPT S 317 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Analysis of data structures and algorithms; computational complexity and design of efficient data-handling procedures.
- 355 Programming Language Design** 3 Course Prerequisite: CPT S 223 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Design concepts of high-level programming languages; survey of existing languages, experience using some languages.
- 360 Systems Programming C/C++** 4 (3-3) Course Prerequisite: CPT S 223 with a C or better; CPT S 260 with a C or better or E E 234 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Implementation of sys-tems programs, concepts of computer operating systems; laboratory experience in using operating system facilities taught in C/C++ programming language.
- 370 Systems Programming Java** 4 (3-3) Course Prerequisite: CPT S 233 with a C or better; CPT S 260 with a C or better or E E 234 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Implementation of systems programs, concepts of computer operating systems; laboratory experience in using operating system facilities. Taught in Java programming language.
- 401 Computers and Society** 3 Course Prerequisite: Junior standing. Skills and literacy course. Ethical and societal issues related to computers and computer networks; computers as enabling technology; computer crime, software theft, privacy, viruses, worms. Credit not granted for both CPT S 401 and CPT S/E E 302.
- 415 Big Data** 3 Course Prerequisite: CPT S 215; CPT S 451. Big data models, databases and query languages, modern distributed database systems and algorithms. (Crosslisted course offered as CPT S 415, CS 415).
- 421 Software Design Project I** 3 (0-9) Course Prerequisite: CPT S 322 with a C or better; CPT S 323 with a C or better or concurrent enrollment; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Large-scale software development including requirements analysis, estimation, design, verification and project management.
- 422 [M] Software Engineering Principles II** 3 Course Prerequisite: CPT S 322 with a C or better; CPT S 323 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Dependable software systems; software verification and validation, testing; CASE environments; software management and evolution.
- 423 [CAPS] Software Design Project II** 3 (1-6) Course Prerequisite: CPT S 421 with a C or better; CPT S 422 with a C or better or concurrent enrollment; certified major in Computer Science, Computer Engineering, or Electrical Engineering; junior standing. Laboratory/group design project for large-scale software development, requirements analysis, estimation, design, verification techniques.
- 424 [CAPS] [M] Data Analytics Capstone** 3 Course Prerequisite: Junior standing. Team-based project that integrates the main aspects of data analytics. (Crosslisted course offered as CPT S 424, CS 424, STAT 424).
- 427 Computer Security** 3 Course Prerequisite: CPT S 360 with a C or better; MATH 216 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Examines cyber vulnerabilities and attacks against computer systems and networks; includes security protection mechanisms, cryptography, secure communication protocols, information flow enforcement, network monitoring, and anonymity techniques. Credit not granted for both CPT S 427 and CPT S 527.
- 430 Numerical Analysis** 3 Course Prerequisite: MATH 315; CPT S 121, CPT S 251, or MATH 300. Fundamentals of numerical computation; finding zeroes of functions, approximation and interpolation; numerical integration (quadrature); numerical solution of ordinary differential equations. (Crosslisted course offered as MATH 448, MATH 548, CPT S 430, CPT S 530). Required preparation must include differential equations and a programming course.
- 434 Neural Network Design and Application** 3 Course Prerequisite: CPT S 122 with a C or better; STAT 360 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Hands-on experience with neural network modeling of nonlinear phenomena; application to classification, forecasting, identification and control. Credit not granted for both CPT S 434 and CPT S 534.
- 438 Scientific Visualization** 3 Course Prerequisite: CPT S 223 with a C or better; CPT S 224 with a C or better; MATH 172 or 182 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Data taxonomy, sampling, plotting, using and extending a visualization package, designing visualization and domain-specific techniques.

- 439 Critical Infrastructure Security: The Emerging Smart Grid** 3 Course Prerequisite: Senior standing. Smart electric grid, communication networks, distributed computing, fault tolerant computing, cyber security, analyzing interdependencies between the smart grid components, smart grid standards and protocols. (Crosslisted course offered as E E 439, CPT S 439).
- 440 Artificial Intelligence** 3 Course Prerequisite: CPT S 122 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. An introduction to the field of artificial intelligence including heuristic search, knowledge representation, deduction, uncertainty reasoning, learning, and symbolic programming languages. Credit not granted for both CPT S 440 and CPT S 540.
- 442 Computer Graphics** 3 Course Prerequisite: CPT S 223 with a C or better; CPT S 224 with a C or better; MATH 220 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Raster operations; transformations and viewing; geometric modeling; visibility and shading; color. Credit not granted for both CPT S 442 and CPT S 542. Cooperative: Open to UI degree-seeking students.
- 443 Human-Computer Interaction** 3 Course Prerequisite: Junior standing; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Concepts and methodologies of engineering, social and behavioral sciences to address ergonomic, cognitive, social and cultural factors in the design and evaluation of human-computer systems. Credit not granted for both CPT S 443 and CPT S 543.
- 451 Introduction to Database Systems** 3 Course Prerequisite: CPT S 223 with a C or better; CPT S 224 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Introduction to database concepts, data models, database languages, database design, implementation issues.
- 452 Compiler Design** 3 Course Prerequisite: CPT S 317 with a C or better; CPT S 355 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Design of lexical analyzers, syntactic analyzers, intermediate code generators, code optimizers and object code generators.
- 453 Graph Theory** 3 Course Prerequisite: MATH 220 or MATH 230. Graphs and their applications, directed graphs, trees, networks, Eulerian and Hamiltonian paths, matrix representations, construction of algorithms. (Crosslisted course offered as MATH 453, CPT S 453). Required preparation must include linear algebra. Required preparation must include linear algebra.
- 455 Introduction to Computer Networks** 3 Course Prerequisite: CPT S 360 with a C or better or E E 234 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Concepts and implementation of computer networks; architectures, protocol layers, internetworking and addressing case studies. (Crosslisted course offered as CPT S 455, E E 455).
- 460 Operating Systems and Computer Architecture** 3 Course Prerequisite: CPT S 360 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Operating systems, computer architectures, and their interrelationships in micro, mini, and large computer systems.
- 464 Distributed Systems Concepts and Programming** 3 Course Prerequisite: CPT S 360 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Concepts of distributed systems; naming, security, networking, replication, synchronization, quality of service; programming middleware. Credit not granted for both CPT S 464 and CPT S 564. Cooperative: Open to UI degree-seeking students.
- 466 Embedded Systems** 3 (2-3) Course Prerequisite: CPT S 360 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. The design and development of real-time and dedicated software systems with an introduction to sensors and actuators. Credit not granted for both CPT S 466 and CPT S 566. Cooperative: Open to UI degree-seeking students.
- 470 Concepts in Biotechnology** 3 Course Prerequisite: [BSCI] UCORE with a C or better; concurrent enrollment in E E 415, E E 416, CPT S 421, CPT S 423, ENTRP 496, ENGR 420, or ENGR 421; certified major in Electrical Engineering, Computer Science, or Computer Engineering. Fundamentals of biological sciences and biotechnology for engineers and computer scientists. (Crosslisted course offered as E E 470, CPT S 470).
- 471 Computational Genomics** 3 Course Prerequisite: CPT S 450 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Fundamental algorithms, techniques and applications. Credit not granted for both CPT S 471 and CPT S 571.
- 476 Software Construction and Maintenance** 3 Course Prerequisite: CPT S 322 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Software quality, construction (API design and use, object-oriented runtime issues), and maintenance (refactoring, reengineering, reverse engineering).
- 478 Software Process and Management** 3 Course Prerequisite: CPT S 322 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Software Engineering Process (definition, assessment, and improvement); Software Engineering Management; Software Configuration Management.
- 479 Mobile Application Development** 3 Course Prerequisite: CPT S 322 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Mobile application development; user interface; location and maps; sensor; camera; cross platform mobile application development tools.
- 481 Python Software Construction** 3 Course Prerequisite: CPT S 223 with a C or better; CPT S 224 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Intensive introduction to the python language; user interface, building and using extension modules; C interfacing; construction of a major project.
- 483 Topics in Computer Science** V 1-4 May be repeated for credit. Course Prerequisite: Certified major in Computer Science, Computer Engineering, or Electrical Engineering. Required background preparation varies with course offering, see instructor. Current topics in computer science or software engineering. Required preparation: Varies with course offering, see instructor.
- 484 Software Requirements** 3 Course Prerequisite: CPT S 322 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Elicitation, analysis, specification, and validation of software requirements as well as the management of requirements during the software life cycle.
- 485 Gerontechnology I** 3 Course Prerequisite: Certified major in Computer Science or Psychology. Introduction to the field of gerontechnology, including aging and senses, mobility and exercise, data analysis, and research methods. (Crosslisted course offered as CPT S 485, PSYCH 485).
- 486 Gerontechnology II** 3 Course Prerequisite: Certified major in Computer Science or Psychology. In-depth exploration of gerontechnology, including socialization, caregiver issues, dementia, app design and data visualization. (Crosslisted course offered as CPT S 486, PSYCH 486).
- 487 Software Design and Architecture** 3 Course Prerequisite: CPT S 321 with a C or better; CPT S 322 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Software design; design principles, patterns, and anti-patterns; design quality attributes and evaluation; architectural styles, architectural patterns and anti-patterns.
- 488 Professional Practice Coop/Internship I** V 1-2 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: By department permission. Practicum for students admitted to the VCEA Professional Practice and Experiential Learning Program; integration of coursework with on-the-job professional experience. (Crosslisted course offered as ENGR 488, BIO ENG 488, CHE 488, CE 488, CPT S 488, E E 488, ME 488, MSE 488, SDC 488). S, F grading.

- 489 Web Development 3** Course Prerequisite: CPT S 322 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Web development using markup languages, style sheet language, and scripting languages; developing and consuming web services; testing web applications.
- 490 Work Study Internship V** 1-9 May be repeated for credit; cumulative maximum 9 hours. Course Prerequisite: Computer Science major; by permission only. Experience in programming and systems analysis in a working environment under supervision of industrial or governmental professionals and faculty. S, F grading.
- 499 Special Problems V** 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 500 Proseminar 1** Faculty research interests, departmental computer systems, computer science research, report preparation. S, F grading.
- 515 Advanced Algorithmics 3** Advanced algorithms and data structures, design and analysis, intractability.
- 516 Algorithmics 3** Discrete structures, automata, formal languages, recursive functions, algorithms, and computability.
- 527 Computer Security 3** Examines cyber vulnerabilities and attacks against computer systems and networks; includes security protection mechanisms, cryptography, secure communication protocols, information flow enforcement, network monitoring, and anonymity techniques. Credit not granted for both CPT S 427 and CPT S 527.
- 530 Numerical Analysis 3** Fundamentals of numerical computation; finding zeroes of functions, approximation and interpolation; numerical integration (quadrature); numerical solution of ordinary differential equations. (Crosslisted course offered as MATH 448, MATH 548, CPT S 430, CPT S 530). Required preparation must include differential equations and a programming course.
- 531 Advanced Matrix Computations 3** Advanced topics in the solution of linear systems and eigenvalue problems, including parallel matrix computations. (Crosslisted course offered as MATH 544, CPT S 531). Required preparation must include numerical analysis. Cooperative: Open to UI degree-seeking students.
- 534 Neural Network Design and Application 3** Hands-on experience with neural network modeling of nonlinear phenomena; application to classification, forecasting, identification and control. Credit not granted for both CPT S 434 and CPT S 534.
- 538 Scientific Visualization 3** Data taxonomy; sampling; plotting; using and extending a visualization package; designing visualizations; domain-specific techniques.
- 540 Artificial Intelligence 3** An introduction to the field of artificial intelligence including heuristic search, knowledge representation, deduction, uncertainty reasoning, learning, and symbolic programming languages. Credit not granted for both CPT S 440 and CPT S 540.
- 542 Computer Graphics 3** Raster operations; transformations and viewing; geometric modeling; visibility and shading; color. Credit not granted for both CPT S 442 and CPT S 542. Cooperative: Open to UI degree-seeking students.
- 543 Human-Computer Interaction 3** Concepts and methodologies of engineering, social and behavioral sciences to address ergonomic, cognitive, social and cultural factors in the design and evaluation of human-computer systems. Credit not granted for both CPT S 443 and CPT S 543.
- 548 Advanced Computer Graphics 3** Solid modeling, visual realism, light and color models, advanced surface generation techniques.
- 550 Parallel Computation 3** Parallel machine models, principles for the design of parallel algorithms, interconnection networks, systolic arrays, computational aspects to VLSI. Required preparation must include differential equations and a programming course.
- 553 Graph Theory 3** Graphs and their applications, directed graphs, trees, networks, Eulerian and Hamiltonian paths, matrix representations, construction of algorithms. (Crosslisted course offered as MATH 453, CPT S 453). Required preparation must include linear algebra. Required preparation must include linear algebra.
- 555 Computer Communication Networks 3** Packet switching networks; multi-access and local-area networks; delay models in data networks; routing and flow control. (Crosslisted course offered as E E 555, CPT S 555).
- 557 Advanced Computer Networks 3** ATM networks, optical WDM networks, and wireless/mobile networks; access, transport, and routing protocols.
- 560 Operating Systems 3** Structure of multiprogramming and multiprocessing; efficient allocation of systems resources; design implementation and performance measurement.
- 561 Computer Architecture 3** Parallel and distributed processors; multiprocessors; interconnection topologies; language-directed architecture; special-purpose architecture.
- 562 Fault Tolerant Computer Systems 3** Fault tolerance aspects involved in design and evaluation of systems; methods of detection and recovery; multicast, middleware, and reconfiguration. (Crosslisted course offered as CPT S 562, E E 562).
- 564 Distributed Systems Concepts and Programming 3** Concepts of distributed systems; naming, security, networking, replication, synchronization, quality of service; programming middleware. Credit not granted for both CPT S 464 and CPT S 564. Cooperative: Open to UI degree-seeking students.
- 566 Embedded Systems 3** (2-3) The design and development of real-time and dedicated software systems with an introduction to sensors and actuators. Credit not granted for both CPT S 466 and CPT S 566. Cooperative: Open to UI degree-seeking students.
- 570 Machine Learning 3** Introduction to building computer systems that learn from their experience; classification and regression problems; unsupervised and reinforcement learning.
- 571 Computational Genomics 3** Fundamental algorithms, techniques and applications. Credit not granted for both CPT S 471 and CPT S 571.
- 572 Numerical Methods in Computational Biology 3** Computational methods for solving scientific problems related to information processing in biological systems at the molecular and cellular levels.
- 573 Bioinformatics Software Development 3** Provides programming skills needed to address current computational problems in bioinformatics; emphasis on mathematical development and software design.
- 580 Advanced Topics in Computer Science 3** May be repeated for credit.
- 581 Software Maintenance 3** Software maintenance, refactoring, reengineering, reverse engineering.
- 582 Software Testing 3** Software testing, testing levels, testing objectives, testing techniques.
- 583 Software Quality 3** Software quality, quality assurance, process and product quality, software measures, quality attributes, quality management.
- 595 Directed Study in Computer Science V** 1 (0-3) to 3 (0-9) May be repeated for credit; cumulative maximum 6 hours. Current topics in computer science.
- 600 Special Projects or Independent Study V** 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination V** 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 702 Master's Special Problems, Directed Study, and/or Examination V** 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Computer Science PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

ELECTRICAL ENGINEERING

Enrollment in 300 and 400-level electrical engineering courses is restricted to certified majors or minors in electrical engineering, computer engineering, or computer science, and to juniors and seniors officially certified into other degree programs requiring 400-level engineering courses.

E E

214 Design of Logic Circuits 4 (3-3) Design and application of combinational logic circuits with exposure to modern methods and design tools; introduction to sequential logic circuits. Recommended preparation: Prior programming class.

221 Numerical Computing for Engineers 2 Course Prerequisite: MATH 172 or 182 with a C or better; MATH 220 or 230 with a C or better. Solutions to engineering problems using modern software tools such as Matlab.

234 Microprocessor Systems 4 (3-3) Course Prerequisite: CPT S 122 with a C or better; E E 214 with a C or better. Microprocessor system architecture, instruction sets, and interfacing; assembly language programming.

261 Electrical Circuits I 3 Course Prerequisite: MATH 315 with a C or better or concurrent enrollment; PHYSICS 202 with a C or better. Application of fundamental concepts of electrical science in linear circuit analysis; mathematical models of electric components and circuits.

262 Electrical Circuits Laboratory I 1 (0-3) Course Prerequisite: E E 261 with a C or better or concurrent enrollment. Electrical instruments; laboratory applications of electric laws; transient and steady-state responses of electrical circuits.

302 Professional Skills in Computing and Engineering 3 Course prerequisite: Certified major in Computer Science, Computer Engineering, or Electrical Engineering; junior standing. Foundation in computing and engineering professional development. (Crosslisted course offered as CPT S 302, E E 302). Credit not granted for both CPT S/E E 302 and CPT S 401.

304 Introduction to Electrical Circuits 2 Course Prerequisite: MATH 315 with a C or better or concurrent enrollment. Basic DC and AC circuits.

311 Electronics 3 Course Prerequisite: E E 261 with a C or better; concurrent enrollment in E E 352; certified major in Electrical Engineering, Computer Science, or Computer Engineering. Fundamental device characteristics including diodes, MOSFETs and bipolar transistors; small- and large-signal characteristics and design of linear circuits.

321 Electrical Circuits II 3 Course Prerequisite: E E 261 with a C or better; certified major in Electrical Engineering, Computer Science, or Computer Engineering. State space analysis, Laplace transforms, network functions, frequency response, Fourier series, two-ports, energy and passivity.

324 [M] Fundamentals of Digital Systems 4 (3-3) Course Prerequisite: E E 214 with a C or better; certified major in Electrical Engineering, Computer Science, or Computer Engineering. Design and analysis of synchronous sequential machines; module and bit-slice devices; alternative architectures; system-level design; asynchronous sequential machines.

331 Electromagnetic Fields and Waves 3 Course Prerequisite: E E 261 with a C or better; E E 262 with a C or better or concurrent enrollment; MATH 315 with a C or better; PHYSICS 202 with a C or better. Certification not required. Students will be required to pass a math skills test. Fundamentals of transmission lines, electrostatics, magnetostatics, and Maxwell's Equations for static fields.

334 Computer Architecture 3 (3-3) Course Prerequisite: E E 234 with a C or better; certified major in Electrical Engineering, Computer Science, or Computer Engineering. Modern developments in digital system design, parallel structures, pipelining, input/output, high speed circuits, laboratory experience in digital system design; emphasis on CPU architecture.

341 Signals and Systems 3 Course Prerequisite: E E 321 with a C or better; STAT 360 with a C or better or concurrent enrollment, or STAT 443 with a C or better or concurrent enrollment; certified major in Electrical Engineering, Computer Science, or Computer Engineering. Discrete and continuous-time signals, LTI systems, convolution, sampling, Fourier transform, filtering, DFT, amplitude modulation, probability applications.

351 Distributed Parameter Systems 3 Course Prerequisite: E E 331 with a C or better; certified major in Electrical Engineering, Computer Science, or Computer Engineering. Maxwell's equations, plane waves, waveguides, resonators, antennas, numerical methods.

352 [M] Electrical Engineering Laboratory I 3 (1-6) Course Prerequisite: Concurrent enrollment in E E 311; E E 321 with a C or better or concurrent enrollment; certified major in Electrical Engineering, Computer Science, or Computer Engineering. Experiments in electrical circuits, measurements and electronics; principles of measurements and measuring instruments.

361 Electrical Power Systems 3 Course Prerequisite: E E 321 with a C or better; E E 331 with a C or better; certified major in Electrical Engineering, Computer Science, or Computer Engineering. Power system hardware; transformers, and electromechanical machinery; introduction to power system operation.

362 [M] Power System Laboratory I 3 (1-6) Course Prerequisite: E E 262 with a C or better; E E 352 with a C or better; concurrent enrollment in E E 361; concurrent enrollment in E E 341; certified major in Electrical Engineering, Computer Science, or Computer Engineering. Experiments in simulation, modeling, transformers, rotating machines, and transmission lines.

415 Design Project Management 2 (1-2) Course Prerequisite: E E 341 with a C or better and E E 361 with a C or better; or E E 334 with a C or better and CPT S 360 with a C or better; certified major in Electrical Engineering, Computer Science, or Computer Engineering. Project scheduling/planning, technical writing, oral presentation skills, working in teams, TQC, TQM, market-driven organizations.

416 [CAPS] [M] Electrical Engineering Design 3 (1-6) Course Prerequisite: E E 415 with a C or better; ENGLISH 402 with a C or better, or concurrent enrollment, or ENGLISH 403 with a C or better, or concurrent enrollment; certified major in E E, Cpt S, Cpt E or Cpt A; senior standing. Electrical engineering design of specific projects including design specification; written and oral presentations and reports.

431 RF and Microwave Circuits and Systems 4 (3-3) Course Prerequisite: Certified major in Electrical Engineering, Computer Science, or Computer Engineering. Design and implementation of RF/microwave modules and systems for telecommunications; microstrip, filters, mixers, amplifiers, frequency synthesizers and transceivers.

432 RF Engineering for Telecommunications 4 (3-3) Course Prerequisite: E E 341 with a C or better; E E 351 with a C or better; STAT 360 with a C or better or STAT 443 with a C or better; certified major in Electrical Engineering, Computer Science, or Computer Engineering. System and propagation issues for wireless telecommunications; cellular, PCS, microwave, and satellite system analysis, design, measurement, and testing.

434 ASIC and Digital Systems Design 3 (2-3) Course Prerequisite: E E 234 with a C or better; E E 321 with a C or better; certified major in Electrical Engineering, Computer Science, or Computer Engineering. Application Specific Integrated Circuit and Digital System Design methods, semi-custom, full-custom, and field-programmable devices; digital system architectures, electronics, and tests.

439 Critical Infrastructure Security: The Emerging Smart Grid 3 Course Prerequisite: Senior standing. Smart electric grid, communication networks, distributed computing, fault tolerant computing, cyber security, analyzing interdependencies between the smart grid components, smart grid standards and protocols. (Crosslisted course offered as E E 439, CPT S 439).

- 451 Digital Communication Systems** 3 Course Prerequisite: E E 341 with a C or better, STAT 360 with a C or better, or STAT 443 with a C or better; certified major in Electrical Engineering, Computer Science, or Computer Engineering. Digital communication techniques; performance of digital communication systems in noise; matched filter detection; quantization. Cooperative: Open to UI degree-seeking students.
- 455 Introduction to Computer Networks** 3 Course Prerequisite: CPT S 360 with a C or better or E E 234 with a C or better; certified major in Computer Science, Computer Engineering, or Electrical Engineering. Concepts and implementation of computer networks; architectures, protocol layers, internetworking and addressing case studies. (Crosslisted course offered as CPT S 455, E E 455).
- 464 Digital Signal Processing I** 3 Course Prerequisite: E E 341 with a C or better; certified major in Electrical Engineering, Computer Science, or Computer Engineering. Discrete and fast Fourier transforms; Z-transform; sampling; discrete convolution; digital filter design; effects of quantization.
- 466 VLSI Design** 3 (2-3) Course Prerequisite: E E 234 with a C or better; E E 324 with a C or better; certified major in Electrical Engineering, Computer Science, or Computer Engineering. Very Large Scale Integrated circuit, system and physical design using CAD software; project specification, modeling, implementation, documentation and reporting.
- 470 Concepts in Biotechnology** 3 Course Prerequisite: [BSCI] UCORE with a C or better; concurrent enrollment in E E 415, E E 416, CPT S 421, CPT S 423, ENTRP 496, ENGR 420, or ENGR 421; certified major in Electrical Engineering, Computer Science, or Computer Engineering. Fundamentals of biological sciences and biotechnology for engineers and computer scientists. (Crosslisted course offered as E E 470, CPT S 470).
- 476 Analog Integrated Circuits** 3 Course Prerequisite: E E 311 with a C or better; certified major in Electrical Engineering, Computer Science, or Computer Engineering. Analysis and design of analog integrated circuits in CMOS and BiCMOS technologies; current mirrors, gain stages, operational amplifiers, frequency response, and compensation. Credit not granted for both E E 476 and 576.
- 477 Analog Integrated Circuits Laboratory** 2 (1-3) Course Prerequisite: concurrent enrollment in E E 476; certified major in Electrical Engineering, Computer Science, or Computer Engineering. Laboratory applications of E E 476 including the computer-aided design of analog integrated circuits; emphasis on design documentation and reporting.
- 483 Topics in Electrical and Computer Engineering** V 1 (0-3) to 3 (0-9) May be repeated for credit; cumulative maximum 6 hours. Current topics in electrical engineering and computer engineering.
- 486 Power Electronics** 3 Course Prerequisite: E E 361 with a C or better; certified major in Electrical Engineering, Computer Science, or Computer Engineering. Analysis and modeling of power electronics-based converters, steady state operation, converter topologies, non-ideal effects; power supplies; applications. Cooperative: Open to UI degree-seeking students.
- 488 Professional Practice Coop/Internship** I V 1-2 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: By department permission. Practicum for students admitted to the VCEA Professional Practice and Experiential Learning Program; integration of coursework with on-the-job professional experience. (Crosslisted course offered as ENGR 488, BIO ENG 488, CHE 488, CE 488, CPT S 488, E E 488, ME 488, MSE 488, SDC 488). S, F grading.
- 489 Introduction to Control Systems** 3 Course Prerequisite: E E 341 with a C or better or concurrent enrollment; certified major in Electrical Engineering, Computer Science, or Computer Engineering. State variable models, system response, stability analysis, root locus analysis and design; frequency-response and state-space analysis and design.
- 491 Performance of Power Systems** 3 Course Prerequisite: E E 361 with a C or better; certified major in Electrical Engineering, Computer Science, or Computer Engineering. Static and dynamic behavior of power systems, powerflow, and economic considerations.
- 492 Renewable Energy Sources** 3 (2-3) Course Prerequisite: E E 361 with a C or better; E E 362 with a C or better or concurrent enrollment; STAT 360 with a C or better or STAT 443 with a C or better; certified major in Electrical Engineering, Computer Science, or Computer Engineering. Design of electrical generation plants using wind, solar and other renewable energy sources including technical, environmental and economic aspects.
- 493 Protection of Power Systems I** 3 Course Prerequisite: E E 361 with a C or better; certified major in Electrical Engineering, Computer Science, or Computer Engineering. Analysis and equipment fundamentals of power system protection; symmetrical components, fault calculations; fuses; and relays including burden calculations.
- 494 Protective Relay Labs** 2 (0-6) Course Prerequisite: E E 361 with a C or better; E E 493 with a C or better or concurrent enrollment; certified major in Electrical Engineering, Computer Science, or Computer Engineering. Experiments and measurements of protective relay equipment under test, simulated fault and fault conditions.
- 495 Internship in Electrical Industry** V 2-4 May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: Electrical Engineering major; by permission only. Students work full time on engineering assignments in approved industries. S, F grading.
- 496 Semiconductor Devices** 3 Course Prerequisite: Certified major in Electrical Engineering, Computer Science, or Computer Engineering. Equilibrium statistics of electrons and holes; carrier dynamics; p-n junctions, metal-semiconductor junctions, BJTs, Mosfets, solar cells, and LEDs.
- 499 Special Problems** V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 501 Linear System Theory** 3 Dynamic systems from the state variable approach; observability, controllability, stability, and sensitivity of differential and nondifferential systems. Cooperative: Open to UI degree-seeking students.
- 502 Linear Multivariable Control** 3 Course Prerequisite: E E 501. Optimal linear feedback control, optimal stochastic observers, LQG/LTR design methodology, modern Wiener-Hopf design, robust controllers. Cooperative: Open to UI degree-seeking students.
- 503 Structure, Dynamics and Control of Large-scale Networks** 3 Course Prerequisite: E E 501; E E 507. Introduction and development of computational and analytical methods required to characterize large-scale networks.
- 504 Modern Optics** 3 Diffraction theory, Fourier transforming and imaging properties of lenses, spatial filtering, holography, temporal and spatial coherence, imaging through random media. Cooperative: Open to UI degree-seeking students.
- 505 Nonlinear System Theory** 3 Course Prerequisite: E E 501. Overview of nonlinear phenomena, Lyapunov stability, input-output stability, periodic orbits, singular perturbation, differential geometric methods, bifurcations and complex behaviors.
- 507 Random Processes in Engineering** 3 Functions of random variables; random sequences; stochastic processes; mean-square stochastic calculus; ergodicity; spectral density; linear transformations, filtering, dynamic systems. Cooperative: Open to UI degree-seeking students.
- 508 Estimation Theory for Signal Processing, Communications, and Control** 3 Course Prerequisite: E E 501; E E 507. Principles of statistical estimation; LLSE; Kalman filtering; smoothing; prediction; maximum-likelihood and Bayesian estimation.
- 509 Adaptive Control** 3 Course Prerequisite: E E 501. Model reference adaptive systems (MRAS), adaptive observers, adaptive control, on-line identification, robustness issues, self-tuning regulators.
- 511 Protection of Power Systems II** 3 Protection of electrical equipment as related to electric power systems with emphasis on digital algorithms. Cooperative: Open to UI degree-seeking students.

- 518 Advanced Electromagnetic Theory I** 3 Electromagnetic waves, electromagnetic theorems and concepts, solutions to the wave equation in rectangular, cylindrical and spherical coordinates. Cooperative: Open to UI degree-seeking students.
- 520 Plasma Engineering** 3 Electromagnetics, kinetic theory, and fluid mechanics of plasmas in space, arcs, plasma processing, coronas, and fusion reactors.
- 521 Analysis of Power Systems** 3 Concepts and practices of modern power engineering, including steady-state and dynamic analysis, economics and control design.
- 522 High Voltage Engineering** 3 High voltage engineering concepts and techniques that facilitate design, research, and development of modern electric power apparatus and interconnected components.
- 523 Power Systems Stability and Control** 3 Course Prerequisite: E E 521 with a B- or better. Dynamic analysis of interconnected electric power system; modeling of synchronous generators, loads and transmission network; small-signal stability and transient stability analysis; dynamic stability controls. Recommended preparation: E E 489 with a B- or better.
- 524 Advanced Computer Architecture** 3 Instruction set architectures, pipelining and super pipelining, instruction level parallelism, superscalar and VLIW processors, cache memory, thread-level parallelism and VLSI.
- 525 Power System Applications of Power Electronics** 3 Course Prerequisite: E E 521. Power electronic converters in modern power systems, FACTS devices, HVDC, compensation; microgrids and integration renewable energy resources; modeling and control.
- 526 High Voltage Overhead Transmission Lines** 3 Course Prerequisite: Graduate standing in Electrical Engineering. Electrical analysis, performance, and design of high voltage transmission lines; power capacity, electromagnetic environment, electromagnetic compatibility, measurements, grounding.
- 527 Antenna Theory and Design** 3 Antenna fundamentals, analytical techniques, characteristics and design procedures for selected types of wire, broadband, and aperture antennas. Cooperative: Open to UI degree-seeking students.
- 528 Advanced Topics in Electromagnetics** 3 May be repeated for credit; cumulative maximum 6 hours. Advanced topics of current interest in wave propagation (electromagnetics, acoustics, or optics).
- 530 Digital Signal Processing II** 3 Course Prerequisite: E E 507. Frequency selective digital filtering, least-squares filtering, adaptive filtering, multirate signal processing.
- 535 Numerical Solutions to EM Problems** 3 Theory and use of finite-difference time-domain; numeric dispersion; absorbing boundary conditions; scattering; radiation; time-domain vs. frequency-domain.
- 536 Power Systems Economics and Electricity Markets** 3 Economic dispatch and optimal power flow; electricity market; short-term load forecasting; electricity price forecasting; price-based unit commitment; arbitrage in electricity markets; market power analysis.
- 545 Data Compression** 3 Course Prerequisite: E E 507. Source coding with a fidelity criterion; quantization theory; predictive, transform and subband coding; noiseless source codes.
- 548 Information Theory and Channel Coding** 3 Course Prerequisite: E E 507. Information theory; entropy, mutual information, source and channel coding theorems, channel capacity, Gaussian channels; channel coding: block and convolutional codes.
- 551 Data Communication Systems** 3 Course Prerequisite: E E 507. Digital communications; multi-amplitude/phase signal constellations; probability of error performance; cutoff rate; Viterbi algorithm; trellis coded modulation.
- 555 Computer Communication Networks** 3 Packet switching networks; multi-access and local-area networks; delay models in data networks; routing and flow control. (Crosslisted course offered as E E 555, CPT S 555).
- 562 Fault Tolerant Computer Systems** 3 Fault tolerance aspects involved in design and evaluation of systems; methods of detection and recovery; multicast, middleware, and reconfiguration. (Crosslisted course offered as CPT S 562, E E 562).
- 571 Advanced Wireless Integrated Circuits and Systems** 3 Analysis and design methodologies of state-of-the-art wireless integrated circuits and systems.
- 576 Analog Integrated Circuits** 3 Analysis and design of analog integrated circuits in CMOS and BiCMOS technologies; current mirrors, gain stages, operational amplifiers, frequency response, and compensation. Credit not granted for both E E 476 and 576.
- 581 Advanced Topics in Power Systems** V 2-3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: E E 521. Power system operations including AGC, economic dispatch and security; power system dynamics; intelligent systems applications. Cooperative: Open to UI degree-seeking students.
- 582 Advanced Topics** V 1-3 May be repeated for credit.
- 586 VLSI Systems Design** 3 VLSI models, layout algorithms, design methodologies, simulation and layout tools, algorithm design for VLSI implementation.
- 587 System on Chip (SoC) Design and Test** 3 System on Chip (SoC) and sub-micron integrated circuit design and testing.
- 595 Directed Study in Electrical Engineering** V 1 (0-3) to 3 (0-9) May be repeated for credit. Current topics in electrical engineering.
- 596 Advanced Analog Integrated Circuits** 3 MOS and BiCMOS technologies; MOS and BiCMOS operational amplifiers; A/D, D/A converters; switched-capacitor filters; continuous-time filters.
- 600 Special Projects or Independent Study** V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination** V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 701 Master's Independent Capstone Project and/or Examination** V 1-6 May be repeated for credit. Capstone project or final examination for professional master's degree under the Graduate School. The credits will include a balloted evaluation of the student's completion of the program's capstone/examination requirements by the program's graduate faculty. Students must have graduate degree-seeking status and obtain approval from their major advisor/committee chair before enrolling for 701 credit. S, U grading.
- 702 Master's Special Problems, Directed Study, and/or Examination** V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.
- 800 Doctoral Research, Dissertation, and/or Examination** V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Electrical Engineering PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Voiland College of Engineering and Architecture

<https://vcea.wsu.edu/>
Dana Hall 146
509-335-5593

Dean, C. S. Claiborn.

The Voiland College of Engineering and Architecture offers degree programs through its School of Design and Construction, the Gene and Linda Voiland School of Chemical Engineering and Bioengineering, the Department of Civil and Environmental Engineering, the School of Electrical

Engineering and Computer Science and the School of Mechanical and Materials Engineering. These degree programs are described under each unit's separate description in the catalog. In addition, the college offers courses common to several degree program curricula and a minor that is available to all non-engineering majors at the university. The minor provides students with a background about how engineering can be applied to real-world problems.

Supplementing the curriculum, the Voiland College Professional Practice and Experiential Learning Office (PPEL) guides students in what it means to be a professional, to act professionally and to develop real-world skills. Professional Practice and experiential learning partnerships in industry help Voiland students apply knowledge acquired in the classroom to real-world situations, develop critical thinking skills, clarify the attitudes about careers in their field, and improve professional soft skills. The PPEL office provides guidance on search strategies for internships, cooperative education, industry mentoring, apprenticeships, practicums, and research experiences, both domestic and international.

Minors

Engineering

The College of Engineering and Architecture offers a minor in engineering. The minor in engineering requires 17 hours, 9 of which must be upper-division taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. Students must complete MATH 172 and PHYSICS 201 to certify for a minor in Engineering and enrolling in any upper-division engineering courses. Courses must be selected from the following prefixes: BIO ENG, CHE, CE, ENGR, E E, ME, and MSE. With the approval of the Associate Dean for Undergraduate Programs and Student Services, up to 3 credits from the ARCH or CST M prefix may be used to fulfill a lower division course requirement for the Engineering minor. All courses taken for the engineering minor must be passed with a grade of C or better.

Description of Courses

ENGINEERING

ENGR

- 101 Success in Engineering Study 2** Engineering study with an emphasis on working in groups and evaluating personal needs and goals.
- 107 [QUAN] Introductory Mathematics for Engineering Applications 3 (2-3)** Course Prerequisite: MATH 103 with a grade of C or better, or a minimum ALEKS math placement score of 70%. Application of mathematics principles to engineering problems across engineering disciplines; concepts from trigonometry to differential equations necessary for sophomore engineering courses.
- 120 Innovation in Design 2 (1-3)** Introduction to engineering disciplines, problem solving, design teamwork and ethics.

121 Grand Challenges in Engineering 1 May be repeated for credit; cumulative maximum 2 hours. Introduction to the Grand Challenge Scholars Program and the National Academy of Engineering's Grand Challenges through a creative learning experience in research or design, an interdisciplinary experience, an entrepreneurship or innovation experience, a global or cross-cultural experience, and a service learning experience. S, F grading.

201 Metal Fabrication 3 (1-6) Credit not granted for students who have already completed AGTM/ENGR 202, 203, or 204. Theory, applications, and practices of welding, machining, and associated techniques in fabricating with metals. (Crosslisted course offered as AGTM 201, ENGR 201).

202 Welding 1 (1-3) Credit not granted for students who have already completed AGTM/ENGR 201. Theory application and practices of welding and associated techniques in fabricating with metals. One of 3 two-week sessions of Metal Fabrication. Each session includes 3 hours lecture and 12 hours lab per week. (Crosslisted course offered as AGTM 202, ENGR 202).

203 Machining 1 (1-3) Credit not granted for students who have already completed AGTM/ENGR 201. Theory application and practices of machining and associated techniques in fabricating with metals. One of 3 two-week sessions of Metal Fabrication. Each session includes 3 hours lecture and 12 hours lab per week. (Crosslisted course offered as AGTM 203, ENGR 203).

204 Metal Fabrication 1 (1-3) Credit not granted for students who have already completed AGTM/ENGR 201. Theory application and practices of cutting and associated techniques in fabricating with metals. One of 3 two-week sessions of Metal Fabrication. Each session includes 3 hours lecture and 12 hours lab per week. (Crosslisted course offered as AGTM 204, ENGR 204).

401 Technology Ventures 3 Focus on commercializing ideas, modifying existing products, exploiting market opportunities, and creating new enterprises.

420 Multidisciplinary Engineering Design I 3 (1-4) Course Prerequisite: Certified engineering major; senior standing. Needs analysis and conceptualization of technological products and business plan for target market; multidisciplinary team development.

421 [CAPS] [M] Multidisciplinary Engineering Design II 3 (1-4) Course Prerequisite: Certified engineering major; senior standing. Prototype solution developed and evaluated and business plan completed; presentation to stake holders; team development and assessment.

430 Interdisciplinary Design I 3 (1-4) Course Prerequisite: Senior standing. Programming, resource flows, site analysis and schematic design; multidisciplinary team development.

431 [CAPS] Interdisciplinary Design II 3 (1-4) Course Prerequisite: ENGR 430 with a C or better; certified engineering major; senior standing. Master plan, design development, construction documentation, sustainability analysis; multidisciplinary team development.

488 Professional Practice Coop/Internship I V 1-2 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: By department permission. Practicum for students admitted to the VCEA Professional Practice and Experiential Learning Program; integration of coursework with on-the-job professional experience. (Crosslisted course offered as ENGR 488, BIO ENG 488, CHE 488, CE 488, CPT S 488, E E 488, ME 488, MSE 488, SDC 488). S, F grading.

489 Professional Practice Coop/Internship II 1 May be repeated for credit; cumulative maximum 3 hours. Course Prerequisite: Sophomore standing; by department permission. Practicum for students admitted to the VCEA Professional Practice and Experiential Learning Program; continuation of ENGR 488. (Crosslisted course offered as ENGR 489, SDC 489). S, F grading.

530 Interdisciplinary Research and Design I 3 (1-4) Literature review, resource flows, research proposal, and multidisciplinary team development.

531 Interdisciplinary Research and Design II 3 (1-4) Design analysis, sustainability analysis, research and scholarly work development; multidisciplinary team development.

School of Engineering and Computer Science - Vancouver

ecs.vancouver.wsu.edu
VECS 201, Vancouver Campus
360-546-9639

Director, H. Gurocak; Associate Professors, X. Chen, D. Kim, S. Solovitz, S. Wallace; Assistant Professors, Z. Chen, T. Karacolak, J. H. Kim, Y. J. Kim, P. Sekhar, H. Tan, X. Zhang, F. Zhao, X. Zhao; Clinical Associate Professors, W. Cochran, D. Lang, J. Lynch; Clinical Assistant Professor, H. Rad; Adjunct Faculty, T. Afentakis, C. Augustine, D. Lowe, F. Musavi, T. Pritchard, H. Talley, Q. Wang, S. Wreggit; Senior Instructor, S. Mocas; Academic Coordinators, K. Gutierrez, E. Walla.

The School of Engineering and Computer Science (ENCS) is an academic unit of the WSU College of Engineering and Architecture that houses the engineering and computer science programs located at WSU Vancouver.

The undergraduate curricula provide students with a solid foundation upon which they can build to meet the challenges associated with their individual career paths and to adapt to rapidly changing technologies. We emphasize the fundamentals and give students significant choice in designing their academic course of study to meet their career goals.

In Computer Science, students can choose from a variety of courses in areas such as intelligent systems, software and hardware systems, graphics and data-intensive computation. In Mechanical Engineering, students can customize their study through four option areas: (1) Micro/nanotechnology; (2) Design and Manufacturing; (3) Mechatronics (robotics and automation); (4) Renewable Energy. The Renewable Energy track is an interdisciplinary option track — available to CS and ECE students as well as MECH students — incorporating elements of all three disciplines. In Electrical Engineering, students can choose upper division elective courses in computer architecture, integrated circuit design and test, electronic devices and materials, and others. Effective writing, speaking and presentation skills, and ethics are also emphasized as important attributes of our graduates.

The School of ENCS is located at Washington State University's campus in Vancouver, Washington and is intended to directly serve students in the southwest Washington region. The programs were established and designed to prepare students to satisfy the needs of regional companies and organizations for engineering and computing professionals. The curricula also prepare students for continued education at the graduate level in computer science, electrical engineering, and mechanical engineering.

The School offers courses of study leading to the degrees of Bachelor of Science in Computer Science (BSCS), Bachelor of Science in Electrical Engineering (BSEE), Bachelor of Science in Mechanical Engineering (BSME), Master of Science in Computer Science (MSCS), and Master of Science in Mechanical Engineering (MSME).

COMPUTER SCIENCE PROGRAM

It is the objective of the computer science program to provide a broad education in the science and application of computing. Students are expected to gain proficiency in the design and implementation of software systems, as well as the application of the theory of computing to that process. In addition, all students will develop a background in the hardware architectures that underlie software systems and the mathematics that provide the basis for science and computing. The degree program also requires students to obtain a background in other scientific disciplines and to develop effective communication skills.

Educational Objectives

The goal of our program is to prepare our graduates for successful professional practice and advanced studies by providing a broad education in computer science and by offering the opportunity to deepen their technical understanding in particular areas of computer science through technical electives. As a graduate of the WSU Vancouver Computer Science program:

- You will be a knowledgeable and skilled computer scientist. Each graduate's knowledge will span the fundamental principles of computer science and include an understanding of several advanced specialty areas. Graduates will have practical experience with tools, languages and systems which are representative of those used by regional industries. Analytical problem solving and well-crafted software solutions will be hallmarks of our graduates.

- You will exhibit the workplace behaviors expected by employers. Employers can expect our graduates to communicate clearly, through writing and speech, to a wide range of audiences. Graduates will maintain task commitment, stay organized, and overcome obstacles. Graduates will demonstrate effectiveness as team members or as team leaders in their jobs and careers.

- You will be committed to high standards of professionalism. Graduates will embrace a professional code of ethics in their practice of computer science. They will recognize the social impact of their work and respect the intellectual property of others.

- You will adapt to the changing landscape of computer science. Effective computer scientists must regularly update their knowledge and skills. WSU Vancouver graduates augment their knowledge and develop new skills with individual study, classes and other techniques. Some graduates will pursue advanced degrees; others will take advantage of professional development opportunities.

Student Learning Outcomes

Graduates of the WSU Vancouver Computer Science program will possess:

- An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline.
- An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
- An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
- An ability to function effectively on teams to accomplish a common goal.
- An understanding of professional, ethical, legal, security and social issues and responsibilities.
- An ability to communicate effectively with a range of audiences.
- An ability to analyze the local and global impact of computing on individuals, organizations, and society.
- Recognition of the need for and an ability to engage in continuing professional development.
- An ability to use current techniques, skills, and tools necessary for computing practice.
- An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
- An ability to apply design and development principles in the construction of software systems of varying complexity.

ELECTRICAL ENGINEERING PROGRAM

Electrical Engineering is a diverse field of engineering study encompassing much of the underlying technology of our modern world. Electrical engineers lead the design of microelectronics, computers, tablets, smartphones, communication networks, control systems and power generation and distribution. Aerospace and military systems include major subsystems conceived and designed by electrical engineers.

The lower division electrical engineering curriculum covers the fundamental aspects of the field, emphasizing the theory, principles and knowledge expected of all electrical engineers. The

upper division curriculum includes elective courses in topics such as computer architecture, integrated circuit design, electronic devices and materials, and others.

The curriculum incorporates extensive hands-on experiences through laboratory work and design projects. All electrical engineering students participate in a senior design project with a team of students, usually spanning multiple engineering disciplines.

Educational Objectives

The goal of the program is to prepare our graduates for successful professional practice and advanced studies by providing a broad education in electrical engineering and by offering the opportunity to deepen their technical understanding in a particular concentration area of related technical electives. Our graduates will:

- Apply technical knowledge and skills as electrical engineers to provide effective solutions in industrial and governmental organizations.
- Utilize effective communication, team, and project management skills to work productively within their professions and communities.
- Conduct themselves as responsible professionals contributing to the greater benefit of society through technology.
- Pursue professional development and/or graduate studies to meet the emerging and evolving demands and increasing responsibilities of a successful career.

Student Learning Outcomes

Graduates of the WSU Vancouver Electrical Engineering program will possess:

- Knowledge of mathematics, science, and engineering and the ability to apply this knowledge in solving problems.
- An ability to design and conduct experiments, as well as to analyze and interpret data.
- Ability to design and realize electrical and electronic components and systems to meet desired needs within realistic constraints such as economical, environmental, social, political, ethical, health and safety, manufacturability and sustainability.
- Ability to function on multi-disciplinary teams.
- Ability to identify, formulate, and solve problems encountered in the practice of electrical engineering.
- Understanding of professional and ethical responsibility.
- Ability to communicate effectively.
- Ability to understand the impact of engineering solutions in a global, economic, environmental and societal context.
- Recognition of the need for and an ability to engage in life-long learning.
- Knowledge of contemporary issues.
- Ability to use the techniques, skills, and modern engineering tools necessary for electrical engineering practice.

MECHANICAL ENGINEERING PROGRAM

Mechanical Engineering provides an excellent education for today's technological world. Mechanical engineers are the backbone of the engineering profession and work in every industry—from transportation, communications, and electronics to bioengineering, commerce,

and manufacturing—in business, government, and universities. Mechanical engineers work with motion, energy, and force, and are involved with analyzing and manufacturing the products they design. They design consumer products, develop robotic systems, computer control systems for machinery, commercial jets, instruments for medicine, high performance sporting equipment, and supervise manufacturing operations.

Our undergraduate curriculum covers the fundamental aspects of the field, emphasizes basic principles and their use in solving engineering problems. The upper division course of study focuses on design, manufacturing process, robotics, computer-aided engineering, thermal and fluid systems, mechanics of materials, micro- and nano-device design and manufacturing, and machine integration and automation. The curriculum incorporates hands-on experiences through laboratory work and design projects. The program provides flexibility to students in customizing their study through four option areas:

- **Micro/Nano Technology Option:** Provides education in basic semiconductor concepts, fundamentals of microscopic phenomena in microfluidics, micro device fabrication techniques, nano-science and its impact on design of the next generation engineering systems.

- **Design and Manufacturing Option:** Emphasizes mechanical system design and realization through computer aided engineering, material failure in mechanical design, and advanced manufacturing.

- **Mechatronics (robotics and automation) Option:** Concentrates on design of mechanical systems with electronic and computer controls, automation and robotics.

- **Renewable Energy Option:** Includes work in Solar Power, Wind Power, as well as enhanced coursework in other option track courses. The Renewable Energy track is an interdisciplinary option track — available to CS and ECE students as well as MECH students — incorporating elements of all three disciplines.

Educational Objectives

The goal of our program is to prepare our graduates for successful professional practice and advanced studies by providing a broad education in mechanical engineering and by offering the opportunity to deepen their technical understanding in a particular concentration area of related technical electives. Our graduates will:

- Apply technical knowledge and skills as mechanical engineers to provide optimal solutions in industrial and government organizations.
- Utilize effective communication, team, and project management skills to work productively within their professions and communities.
- Conduct themselves in a responsible, professional, and ethical manner.
- Continue their education through completion of training courses, workshops, seminars, and/or graduate studies relevant to their professional development.

Student Learning Outcomes

Graduates of the WSU Vancouver Mechanical Engineering program will possess:

- Knowledge of mathematics, science and engineering and the ability to apply this knowledge in solving problems.

- An ability to design and conduct experiments as well as to analyze and interpret data.

- Ability to design and realize thermal and mechanical components, systems, or processes to meet desired needs and realistic constraints such as economical, environmental, social, political, ethical, health and safety, manufacturability and sustainability.

- Ability to function on multidisciplinary teams.
- Ability to identify, formulate and solve problems encountered in the practice of mechanical engineering.

- Understanding of professional and ethical responsibility.

- Ability to communicate effectively.
- Ability to understand the impact of engineering solutions in a global, economic, environmental and societal context.

- Recognition of the need for and an ability to engage in life-long learning.

- Knowledge of contemporary issues.

- Ability to use the techniques, skills and modern engineering tools necessary for mechanical engineering practice.

Certification in the Major

Certification in a degree program is required by WSU prior to the granting of a baccalaureate degree. Qualification for initial certification, as well as continuation of certified status, will be evaluated based on several criteria including academic integrity, overall grade point average (GPA), and GPA in mathematics, science, and major core courses; computer science, electrical engineering, or mechanical engineering. For electrical engineering and mechanical engineering degrees, certification will be initiated once the required courses have been completed. For the computer science degree, students will apply for initial certification once the required courses have been completed. Additional details regarding certification in the major are available in the schedules of studies for each major or from the School of ENCS academic coordinators.

Transfer Students

The School of Engineering and Computer Science cooperates closely with Washington community colleges to facilitate the transfer of students into its computer science, electrical engineering, and mechanical engineering programs. Students planning to transfer into the School of ENCS are strongly encouraged to contact an ENCS academic coordinator to evaluate the transfer course credits and to help plan the continuation of their academic career at Washington State University Vancouver.

Students will note that a number of the courses offered by the School of ENCS have identical course numbers and similar descriptions to courses offered by the School of Electrical Engineering and Computer Science and the School of Mechanical and Materials Engineering on the Pullman campus. The transfer of course credit between these Schools is not automatic or guaranteed. Students intending to take courses in one School for credit in another are advised to consult with the academic advisor for their degree program, in advance, to assess how the courses may fulfill their degree requirements.

Preparation for Graduate Study

The Master of Science in Computer Science program in the School of ENCS is a thesis program and requires 30 credit hours, including 21 hours

of graded course work and 9 credits of thesis research (CS 700). The coursework and research are in the general areas of software engineering, artificial intelligence, computer networks, database systems, and computer graphics. Sophisticated facilities are available for instruction and research, including a high performance computing cluster and dedicated high-bandwidth network facilities. Teaching and research assistantships are available for qualified students.

Before undertaking graduate study in computer science, the student should have completed a baccalaureate degree substantially similar to the BSCS degree described below in the BSCS schedule of studies. Students from other academic disciplines are encouraged to apply, however such students will be required to take or have taken the equivalent of the following courses: CS 317, CS 360 and CS 450, including all prerequisites for these courses. An undergraduate grade point average of 3.0 is a minimum for admission to the MS program.

The Master of Science in Mechanical Engineering program in the School of ENCS is a thesis program and requires a minimum of 30 credit hours. This includes 21 hours of graded coursework beyond the bachelor's degree, plus a minimum of 4 thesis credits (MECH 700). The coursework and research are in the general areas of advanced materials, computer-aided engineering, dynamics, fluid dynamics, heat and mass transfer, manufacturing, micro and nanotechnology, robotics, and solid mechanics. Our laboratories are equipped with state-of-the-art equipment worth more than \$6 million. Teaching and research assistantships are available for qualified students.

A Bachelor of Science degree from an accredited program in mechanical engineering provides a good background for the MSME graduate program. Students with bachelor degrees in other engineering disciplines, mathematics, and the physical sciences may be admitted, but will be required to make up requisite undergraduate deficiencies. An undergraduate grade point average of 3.0 is a minimum for admission to the MS program.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

BACHELOR OF SCIENCE, COMPUTER SCIENCE (VANCOUVER ONLY) (120 HOURS)

Each May the computer science faculty will examine the available capacity in the program and determine the number of new students to be certified for the fall semester. Similarly, the faculty will determine in September the number of additional students to be certified for the spring semester. Students must be certified computer science majors, or minors, to enroll in 300 or 400 level computer science courses. Certification is required by WSU prior to the granting of a baccalaureate degree.

Minimum qualifications for certification in computer science are:

- Completion of MATH 171, 172, CS 121, 122, 166, 224, 260, 261, and PHYSICS 201, or their equivalents, with a grade of C or better.
- A cumulative GPA of 2.0 or better.

• Students must be in good academic standing when they apply for certification with a 2.0 GPA or better in their prior semester's coursework.

Students applying for certification for the fall semester must submit all necessary transcripts, along with their application for certification, by July 1st. Students applying for certification in the spring semester must submit their application (and necessary transcripts) by November 1st. Applicants will be notified of the decision by July 15th for fall semester applicants, or by November 15th for spring applicants.

If the number of applications for certification exceeds the program's capacity, the following criteria will be used to select the applicants to be certified:

- GPA earned in the courses required for certification.
- Overall GPA.

Students who meet the minimum qualifications for certification, but are denied certification, may appeal the decision. The appeal should describe any special circumstances to be considered. A faculty committee will consider the appeal - the circumstances described, trends in the student's grades and course load - and make a final decision regarding certification. The appeal must be submitted within 2 weeks of the notification described above. Appeals will be considered and final decisions made by August 1st and January 1st for the fall and spring semesters, respectively. Previously-certified students who become academically deficient under WSU's academic regulations are subject to decertification.

No courses listed in this schedule of studies may be taken on a pass/fail basis. All listed computer science courses, and their prerequisites, must be completed with a grade of C or better.

First Year

<i>First Term</i>	<i>Hours</i>
CS 121	4
HISTORY 105 [ROOT]	3
Humanities [HUM]	3
MATH 171 [QUAN]	4

<i>Second Term</i>	<i>Hours</i>
CS 122	4
CS 166	3
ENGLISH 101 [WRITG]	3
MATH 172	4

Second Year

<i>First Term</i>	<i>Hours</i>
CS 223	3
CS 260	3
ECONS 101 [SSCI] or 102 [SSCI]	3
MATH 273	2
PHYSICS 201 [PSCI]	4

<i>Second Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab	4
CS 224	3
CS 261	3
MATH 220	2
PHYSICS 202	4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
CS 317	3

CS 320 [M]	3
CS Option Course ¹	3
ENGLISH 402 [WRITG]	3
STAT 360	3

<i>Second Term</i>	<i>Hours</i>
CS 351	3
CS 355	3
CS 360	4
CS Option Course ¹	3
Diversity [DIVR]	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
CS 420 [CAPS] [M]	3
CS 450	3
CS Option Courses ¹	6

<i>Second Term</i>	<i>Hours</i>
CS 402 [M]	3
CS 421	3
CS 460	3
CS Option Courses ¹	6

¹ 18 credit hours of option area courses are required for completion of the degree program. The option courses must be chosen from 300-400-level CS courses and may also include up to 6 hours from the following list: MATH 315, 448, 453, ECE 324, 366, and 424. Other computer science-related courses may be substituted, as approved by the department.

BACHELOR OF SCIENCE, ELECTRICAL ENGINEERING (VANCOUVER ONLY) (121 HOURS)

Students who have completed at least 30 semester hours of course work and who have completed CHEM 105; CS 251; ECE 214, ECE 234, ECE 260, MATH 273, and PHYSICS 202, or their equivalents, are eligible for certification into the Bachelor of Science in Electrical Engineering program. All courses required for certification must be completed with a grade of C or better. Enrollment in many upper-division electrical engineering courses is restricted to certified majors or minors in electrical or mechanical engineering.

When it becomes necessary to limit enrollment, the overall GPA as well as the GPA for the prerequisite courses listed will be important factors. Students who have not completed all of the prerequisite courses will be placed in a pre-engineering major.

No courses listed in this schedule of studies may be taken on a pass/fail basis. All upper-division electrical engineering courses must be completed with a minimum 2.0 average GPA.

First Year

<i>First Term</i>	<i>Hours</i>
CHEM 105 [PSCI]	4
ECE 101	2
HISTORY 105 [ROOT]	3
Humanities [HUM]	3
MATH 171 [QUAN]	4

<i>Second Term</i>	<i>Hours</i>
CS 251	4
ENGLISH 101 [WRITG]	3

MATH 172	4
PHYSICS 201 [PSCI]	4

Second Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI]	3 or 4
ECE 214	3
MATH 220	2
MATH 273	2
PHYSICS 202	4

<i>Second Term</i>	<i>Hours</i>
Diversity [DIVR]	3
ECE 234	3
ECE 260	4
ECONS 101 [SSCI] or 102 [SSCI]	3
MATH 315	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
ECE 321	3
ECE 325	4
ECE Elective ¹	3
ENGLISH 402 [WRITG] [M]	3
STAT 360	3

<i>Second Term</i>	<i>Hours</i>
ECE 341	3
ECE 370	3
ECE Electives ¹	9

Fourth Year

<i>First Term</i>	<i>Hours</i>
ECE 411	3
ECE 451	2
ECE Electives ¹	9

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
ECE 405 [M] or CS 402 [M]	3
ECE 452 [M] [CAPS]	3
ECE Electives ¹	6

¹ Electives must be chosen from CS 330, 466, ECE 302, 316, 324, 327, 349, 366, 414, 421, 424, 425, 461, 462, 466, 471, 476, 477, 486, 496, MECH 441, 467, 468, or be pre-approved by a faculty advisor.

BACHELOR OF SCIENCE, MECHANICAL ENGINEERING (VANCOUVER ONLY) (121 HOURS)

Students who have completed at least 30 semester hours of course work and who have completed CHEM 105; MATH 220, 273; MECH 211, 212, 215; and PHYSICS 201 or their equivalents are eligible for certification into the Bachelor of Science in Mechanical Engineering program. All courses required for certification must be completed with a grade of C or better. Enrollment in many upper-division mechanical engineering courses is restricted to certified majors or minors in mechanical engineering.

When it becomes necessary to limit enrollment, the overall GPA as well as the GPA for the prerequisite courses listed will be important factors. Students who have not completed all of the prerequisite courses will be placed in a pre-engineering major.

No courses listed in this schedule of studies may be taken on a pass/fail basis. All upper-division mechanical engineering courses must be completed with a minimum 2.0 average GPA.

First Year

First Term	Hours
CHEM 105 [PSCI]	4
HISTORY 105 [ROOT]	3
Humanities [HUM]	3
MATH 171 [QUAN]	4
MECH 101	2

Second Term	Hours
CHEM 106	4
ENGLISH 101 [WRTG]	3
MATH 172	4
MECH 103	2

Second Year

First Term	Hours
ECONS 101 [SSCI] or 102 [SSCI]	3
MATH 220	2
MATH 273	2
MECH 211	3
MECH 251	2
PHYSICS 201	4

Second Term	Hours
Biological Sciences [BSCI]	3 or 4
MATH 315	3
MECH 212	3
MECH 215	3
PHYSICS 202	4
Complete Writing Portfolio	

Third Year

First Term	Hours
ENGLISH 402 [WRTG]	3
MECH 301	3
MECH 303	3
MECH 304	3
MECH 309 [M]	3

Second Term	Hours
MECH 310	4
MECH 314	3
MECH 348	3
MECH 404	3
400-level MECH Option Course ¹	3

Fourth Year

First Term	Hours
MECH 402	3
MECH 414	3
MECH 416 [M]	2
400-level MECH Option Course ¹	3
400-level MECH Technical Elective ¹	3

Second Term	Hours
Creative & Professional Arts [ARTS]	3
Diversity [DIVR]	3
MECH 417 [CAPS]	3
400-level MECH Option Course ¹	3
400-level MECH Technical Elective ¹	3

¹ The program emphasizes fundamentals and provides flexibility in selecting a course of study through five technical electives. Students can either take any five elective courses, provided they meet

the prerequisites, or they can choose to take a set of related electives comprising an option area and additional electives of their choice. Students are required to work with their faculty advisor to develop their schedule of studies as they are admitted to the program at the junior level. The following are the technical elective courses and option areas: (Option 1) Micro and Nanotechnology: MECH 431, 438, 450; (Option 2) Design and Manufacturing: MECH 476, 485, 489; (Option 3) Mechatronics: MECH 405, 467, 468.; (Option 4) Renewable Energy: MECH 441, ECE 421, choice of two courses from MECH 405, 468, 431, and 450.

Minors

Computer Science

The minor in computer science consists of 21 credit hours that must include either CS 121 or 251, plus CS 122, 224, 360, and two 300-400 level CS courses, excluding CS 402. Lower division (100-200 level) courses may be taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. Upper division (300-400 level) courses must be taken in residence at WSU. All courses must be completed with a grade of C or better and all course prerequisites must be met. The minor course of study must be pre-approved by the computer science academic coordinator.

Mechanical Engineering Minor

A mechanical engineering minor requires a minimum of 16 semester hours, 9 of which must be in upper-division course work and taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. This minor requires (1) MECH 211 and 212, (2) Four out of the following MECH 215, 303, 309, 314, 348, 431, 438, 441, 450, 467, or 468. At least one of these four courses must be MECH 215, 303, or 348. All prerequisites for minor courses must be met. All courses must be completed with a minimum 2.0 average GPA.

Description of Courses

COMPUTER SCIENCE - VANCOUVER

Enrollment in 400-level computer science courses is restricted to certified majors or minors in computer science and to juniors and seniors officially certified in other degree programs requiring these computer science courses.

CS

115 Introduction to Data Analytics 3 Basic concepts, principles, and tools used in data analytics. (Crosslisted course offered as CPT S 115, CS 115, STAT 115).

121 Program Design and Development 4 (3-3) Course Prerequisite: MATH 106 with a C or better, MATH 107 with a C or better, MATH 171 with a C or better, MATH 172 with a C or better, or a minimum ALEKS math placement score of 80%. Formulation of problems and top-down design of programs in a modern structured language for their solution on a digital computer.

122 Data Structures 4 (3-3) Course Prerequisite: CS 121 with a C or better, or CS 251 with a C or better. Advanced programming techniques: data structures, recursion, sorting and searching, and basics of algorithm analysis.

166 Foundations of Computational Theory 3 Course Prerequisite: CS 122 with a C or better or concurrent enrollment; MATH 106 with a C or better, or MATH 107 with a C or better, or MATH 171 with a C or better, or ALEKS math placement score of 80%. Introduction to the theoretical foundations of computing. Combinatorics, relations, trees, graphs, Boolean algebra, proof methods, and discrete probability as applied to computer science.

215 Data Analytics Systems and Algorithms 3 Course Prerequisite: CPT S 122, CPT S 132, or CS 122. Exploration of fundamental concepts, constructs, and techniques of modern data analytics systems. (Crosslisted course offered as CPT S 215, CS 215).

223 Advanced Data Structures 3 Course Prerequisite: CS 122 with a C or better; CS 216 with a C or better. Advanced data structures, object oriented programming concepts, concurrency, and program design principles.

224 Programming Tools 3 Course Prerequisite: CS 122 with a C or better. Debugging tools, scripting languages, UNIX programming tools, introduction to graphical user interface programming.

251 C Programming for Engineers 4 (3-3) Course Prerequisite: MATH 171 with a C or better or concurrent enrollment. Introduction to the C programming language and application to engineering problem solving; introduction to data structures, sorting and searching; laboratory use of integrated development environments and debugging tools.

260 Computer Organization 3 Course Prerequisite: CS 122 with a C or better. Introduction to computer architecture, data representation, design and analysis of instruction sets, implementation of machine instructions, virtual memory and multiprocessing.

261 C and Assembly Language Programming 3 Course Prerequisite: CS 260 with a C or better. C language concepts, professional practices and C programming; module linkage; assembly language concepts and programming.

315 Introduction to Data Mining 3 Course Prerequisite: CPT S 215. The process of automatically extracting valid, useful, and previously unknown information from large repositories. (Crosslisted course offered as CPT S 315, CS 315).

317 Automata and Formal Languages 3 Course Prerequisite: CS 122 with a C or better; CS 216 with a C or better; certified major in Computer Science. Finite automata, regular sets, pushdown automata, context-free language, Turing machines and the halting problem.

- 320 [M] Fundamentals of Software Engineering** 3 Course Prerequisite: CS 224 with a C or better; CS 216 with a C or better; ENGLISH 402 with a C or better or concurrent enrollment; certified major in Computer Science. Introduction to software engineering; requirements analysis, definition and specification; software process models; prototyping; architecture; object-oriented design with UML.
- 330 Numerical Computing** 3 Course Prerequisite: CS 251 with a C or better, or CS 261 with a C or better; MATH 172 or 182 with a C or better; MATH 220 with a C or better; certified major in Computer Science. Power and limitation of numerical solutions; design, analysis and implementation of numerical algorithms; visualization and rendering.
- 351 Introduction to Database Systems** 3 Course Prerequisite: CS 223 with a C or better; CS 224 with a C or better; certified major in Computer Science. Introduction to database concepts, data models, database languages, database design, implementation issues.
- 355 Programming Language Design** 3 Course Prerequisite: CS 223 with a C or better; CS 224 with a C or better; certified major in Computer Science. Design concepts of high-level programming languages; survey of existing languages, experience using some languages.
- 360 Systems Programming** 4 (3-3) Course Prerequisite: CS 224 with a C or better; CS 251 with a C or better, or CS 261 with a C or better; certified major in Computer Science. Implementation of systems programs, concepts of computer operating systems; laboratory experience in using operating system facilities.
- 402 [M] Social and Professional Issues in Computer Science** 3 Course Prerequisite: ENGLISH 402 or 403; certified major in Computer Science or Electrical Engineering. Social, legal, ethical and professional issues that arise in the context of computing.
- 415 Big Data** 3 Course Prerequisite: CPT S 215; CPT S 451. Big data models, databases and query languages, modern distributed database systems and algorithms. (Crosslisted course offered as CPT S 415, CS 415).
- 420 [CAPS] Software Design Project I** 3 Course Prerequisite: CS 320 with a C or better; CS 360 with a C or better; senior standing. Development of software in a team environment; project management; unit and integration testing, bug tracking, configuration management, software process models; object-oriented design with UML.
- 421 Software Design Project II** 3 (2-3) Course Prerequisite: CS 420 with a C or better; senior standing. Large-scale software development in a team environment; software design and implementation, project management, testing and integration; teamwork skills, communication, source code management, documentation and presentations. Continuation and completion of CS 420 project.
- 424 [CAPS] [M] Data Analytics Capstone** 3 Course Prerequisite: Junior standing. Team-based project that integrates the main aspects of data analytics. (Crosslisted course offered as CPT S 424, CS 424, STAT 424).
- 425 Digital Forensics** 3 Course Prerequisite: CS 360 with a C or better. Use of computers in the investigation of criminal and civil incidents in which computers or computer technology play a significant or interesting role.
- 427 Computer Security** 3 Course Prerequisite: CS 216 with a C or better; CS 360 with a C or better. Computer security concepts, models and mechanism; encryption technology, formal models, policy and ethical implications. Credit not granted for both CS 427 and CS 527.
- 440 Artificial Intelligence** 3 Course Prerequisite: CS 320 with a C or better; STAT 212 with a C or better or STAT 360 with a C or better. Knowledge representation and automated problem solving; theory and application of agent programming.
- 442 Computer Graphics** 3 Course Prerequisite: CS 223 with a C or better; CS 320 with a C or better; MATH 220 with a C or better. Raster operations; transformations and viewing; geometric modeling; visibility and shading; color. Credit not granted for both CS 442 and CS 542.
- 443 Human-Computer Interaction** 3 Course Prerequisite: Certified major in Computer Science; junior standing. Introduction to the field of human-computer interaction; understanding the system user; user-centered design and evaluation techniques including heuristic evaluation and usability testing.
- 447 Computer Game Design** 3 Course Prerequisite: CS 223 with a C or better; CS 320 with a C or better. Design and implementation of computer games. Credit not granted for both CS 447 and CS 547.
- 450 Design and Analysis of Algorithms** 3 Course Prerequisite: CS 223 with a C or better; STAT 360 with a C or better; certified major in Computer Science. Analysis of data structures and algorithms; computational complexity and design of efficient data-handling procedures.
- 452 Compiler Design** 3 Course Prerequisite: CS 317 with a C or better; CS 355 with a C or better. Design of lexical analyzers, syntactic analyzers, intermediate code generators, code optimizers and object code generators.
- 453 Cloud Data Management** 3 Course Prerequisite: CS 351 with a C or better. Principles of cloud data management: data models, fragmentation, processing paradigms, consistency, storage, and commercial cloud data management platforms.
- 455 Introduction to Computer Networks** 3 Course Prerequisite: CS 360 with a C or better. Concepts and implementation of computer networks; architectures, protocol layers, internetworking and addressing case studies.
- 458 Mobile Application Development** 3 Course Prerequisite: CS 360 with a C or better. Design and development of mobile applications; introduction to mobile application frameworks, including user interface, sensors, event handling, data management and network communication.
- 460 Operating Systems** 3 Course Prerequisite: CS 360 with a C or better. Role and purpose of operating systems, process and memory management, I/O device management and drivers, file system concepts and design.
- 466 Embedded Systems** 3 (2-3) Course Prerequisite: CS 360 with a C or better, or ECE 370 with a C or better; senior standing. Design and development of real-time and dedicated software systems with an introduction to sensors and actuators. Credit not granted for both CS 466 and CS 566.
- 483 Topics in Computer Science** V 1-4 May be repeated for credit. Course Prerequisite: Certified major in Computer Science. Current topics in computer science or software engineering.
- 499 Special Problems** V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 516 Theory of Computation** 3 Discrete structures, automata, formal languages, recursive functions, algorithms, computability, and complexity. Required preparation must include a strong background in discrete mathematics, automata, and formal languages.
- 518 Advanced Analysis of Algorithms** 3 Advanced Study in design and analysis of algorithms, including randomized and approximation algorithms, linear programming, network flow and string matching.
- 521 Software Engineering Analysis** 3 Research in software engineering; application of quantitative techniques in the software life cycle; current software engineering literature; exploration of techniques of mathematical modeling and solutions to software engineering problems. Required preparation must include a familiarity with the use and theory behind current software engineering practices.
- 527 Computer Security** 3 Computer security concepts, models and mechanism; encryption technology, formal models, policy and ethical implications. Credit not granted for both CS 427 and CS 527.
- 541 Artificial Intelligence** 3 Intelligent computer programs; simulation of cognitive processes. Required preparation must include prior knowledge and experience in artificial intelligence.
- 542 Computer Graphics** 3 Raster operations; transformations and viewing; geometric modeling; visibility and shading; color. Credit not granted for both CS 442 and CS 542.

- 547 Computer Game Design** 3 Design and implementation of computer games. Credit not granted for both CS 447 and CS 547.
- 548 Advanced Computer Graphics** 3 Solid modeling, visual realism, light and color models, advanced surface generation techniques. Required preparation must include a prior knowledge and understanding of linear algebra and the graphics pipeline.
- 558 Wireless Sensor Networks** 3 Design and implementation of sensor networks. Required preparation must include a prior knowledge and understanding of communication protocols such as TCP/IP and experience in network programming.
- 566 Embedded Systems** 3 (2-3) Design and development of real-time and dedicated software systems with an introduction to sensors and actuators. Credit not granted for both CS 466 and CS 566.
- 570 Machine Learning** 3 Introduction to building computer systems that learn from their experience; classification and regression problems; unsupervised and reinforcement learning.
- 580 Advanced Topics in Computer Science** 3 May be repeated for credit.
- 595 Directed Study in Computer Science** V 1 (0-3) to 3 (0-9) May be repeated for credit; cumulative maximum 3 hours. Current topics in computer science.
- 700 Master's Research, Thesis, and/or Examination** V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- ELECTRICAL ENGINEERING - VANCOUVER**
- Enrollment in many upper-level electrical engineering courses is restricted to certified majors or minors in electrical engineering.*
- ECE**
- 101 Introduction to Electrical Engineering** 2 (1-3) Course Prerequisite: MATH 106, MATH 171 or concurrent enrollment, or a minimum ALEKS math placement score of 80%. Introduction to the field of electrical engineering and the fundamental concepts behind electronic devices and systems.
- 214 Design of Logic Circuits** 3 (2-3) Course Prerequisite: ECE 101; MATH 106, MATH 171 or concurrent enrollment, or a minimum ALEKS math placement score of 80%. Design and application of combinational logic circuits with exposure to modern methods and design tools; introduction to sequential logic circuits.
- 234 Microprocessor Systems** 3 (2-3) Course Prerequisite: CS 251 or CS 261; ECE 214. Microprocessor system architecture, instruction sets and interfacing; assembly language programming.
- 260 Circuit Modeling and Analysis I** 4 (3-3) Course Prerequisite: ECE 101; MATH 315 or concurrent enrollment. Circuit modeling, analysis, component models, theory and simulation tools; application of network theory to solve linear and nonlinear circuits under static and dynamic operation.
- 295 Digital Communications I** 3 Course Prerequisite: ECE 214; ECE 260 or concurrent enrollment. Hardware and protocols for digital communications systems; Ethernet, ATM, physical and media access layer; encoding and modulation techniques.
- 302 Properties of Electronic Materials** 3 Course Prerequisite: CHEM 105; PHYS 202. Schrodinger's wave equation, potential barrier problems, crystal structure and bonds, band theory of solids, semiconductors, super conductor, dielectric and magnetic material properties.
- 316 Nanotechnology for Semiconductor and Renewable Energy Applications** 3 Course Prerequisite: CHEM 105; PHYSICS 202. Scaling laws, nanofabrication, nanomaterials, nanoscale characterization; nanotechnology in semiconductor industry, critical dimension, solar cells, fuel cells, energy storage, batteries, energy efficiency and energy savings.
- 321 Circuit Modeling and Analysis II** 3 Course Prerequisite: ECE 260; MATH 315. Laplace transforms, Fourier analysis, state space analysis, two port networks.
- 324 Digital Systems Design** 3 (2-3) Course Prerequisite: ECE 214. Implementation of datapaths and controllers, use of hardware description languages and automated synthesis tools, field programmable gate arrays and simulation; integrated circuit layout.
- 325 Electronic Devices and Applications** 4 (3-3) Course Prerequisite: ECE 214; ECE 260. MOS small and large signal models, bipolar transistors, biasing and parasitics, amplifier design and feedback, frequency response; circuit simulation and device models.
- 327 Introduction to Power Electronics** 3 (2-3) Course Prerequisite: ECE 321; ECE 325. Power semiconductors, high-frequency magnetics, and their application to switch-mode power converters, electric motor drives, and utility systems.
- 341 Signals and Systems** 3 (2-3) Course Prerequisite: ECE 321. Discrete and continuous systems, sampling, convolution, Fourier and Z transforms, modulation; introduction to distributed parameter systems.
- 345 Digital Communications II** 3 Course Prerequisite: ECE 295; STAT 360 or concurrent enrollment. Digitally modulated signals and their spectral characteristics, modulation/demodulation techniques, coherent/non-coherent detection methods; source and channel coding, spread-spectrum and multiple access techniques.
- 349 Principles of Solid State Devices** 3 Course Prerequisite: ECE 325 or concurrent enrollment; CHEM 105; PHYSICS 202. Semiconductor theory; carrier diffusion and drift, direct and indirect energy materials, homo and heterojunctions, operations principles of bipolar junctions and MOS field effect transistors, metal-semiconductor contacts.
- 366 Introduction to VLSI Design** 3 (2-3) Course Prerequisite: ECE 214; ECE 349. CMOS devices and deep-submicron fabrication technology; interconnect modeling, power and clock distribution, area, power and speed optimization.
- 370 Electromagnetic Fields and Waves** 3 Course Prerequisite: ECE 260; MATH 315. Electrostatic and magnetostatic fields; Faraday's laws, Maxwell's equations, electromagnetic properties of matter, uniform plane waves and transmission lines.
- 405 [M] Professional Issues and Ethics in Electrical Engineering** 3 Course Prerequisite: ENGLISH 402; certified major in Electrical Engineering. Social, legal and professional issues that arise in the context of electrical engineering.
- 411 Energy Systems** 3 (2-3) Course Prerequisite: ECE 321. Investigation and analysis of the design, tradeoffs and efficiency of conventional and alternative energy sources; energy transmission, storage and conversion systems.
- 414 Introduction to Digital Signal Processing** 3 (2-3) Course Prerequisite: ECE 341. Discrete and fast Fourier Transforms, Z-Transform, sampling, discrete convolution, digital filter design and effects of quantization.
- 421 Microsystems in Renewable Energy** 3 (2-3) Course Prerequisite: PHYSICS 202. Materials, structures, and devices used in renewable energy systems with the focus on solar cells.
- 424 Computer Architecture and Design** 3 Course Prerequisite: ECE 234 or CS 261. Architecture, organization and design of modern digital computers; instruction sets, computer arithmetic, pipelining, memory hierarchy, storage and input/output topics.
- 425 RF Devices and Circuits** 3 (2-3) Course Prerequisite: ECE 341; ECE 370. Semiconductor devices and circuit design targeting wireless applications.
- 451 Capstone Design I** 2 Course Prerequisite: ECE 325; ECE 370; ENGLISH 402; senior standing; certified major in Electrical Engineering. First of a two-course senior design project sequence; design for manufacture, schedule estimation and tracking, costing, ethics and proposal writing.
- 452 [CAPS] [M] Capstone Design II** 3 Course Prerequisite: ECE 451; senior standing. Execution phase of the senior design project course sequence; independent or team project proposed in ECE 451 is designed and implemented.

- 461 Power Systems Analysis and Design I** 3 Course Prerequisite: ECE 370. Basic components and their representations in power systems, power transformers, synchronous machines, loads, and transmission lines.
- 462 Power Systems Analysis and Design II** 3 Course Prerequisite: ECE 461. Power flow, symmetrical faults, symmetrical components, unsymmetrical faults, and transient stability, the computer simulation software application in power systems analysis.
- 466 Semiconductor Material and Device Characterization** 3 Course Prerequisite: ECE 349. Modern semiconductor material and device characterization techniques; electrical, optical, and physical characterization methods commonly used in semiconductor industry.
- 471 Antenna Design and Analysis** 3 (2-3) Course Prerequisite: ECE 370. Antenna types and radiation, wire antennas, antenna arrays broadband and aperture antennas; theory and simulation of antenna performance, laboratory testing and measurement.
- 475 Electro-optical Devices and Systems** 3 Course Prerequisite: ECE 370; STAT 360. Electromagnetic reflection and refraction, waveguide theory; theory and application of optical source and sensor devices; coupling, dispersion and loss in waveguides and optical fiber.
- 476 Computer-aided Design for VLSI** 3 (2-3) Course Prerequisite: ECE 324; ECE 366. Algorithms and design flows for VLSI design synthesis and verification.
- 477 VLSI Testing and Design for Test** 3 (2-3) Course Prerequisite: ECE 324; ECE 366. Test pattern generation for digital devices, controllability and observability; tester characteristics and capabilities; fault modeling and analysis of test coverage; built-in self-test techniques.
- 483 Topics in Electrical Engineering** V 1-4 May be repeated for credit; cumulative maximum 9 hours. Course Prerequisite: Junior standing; certified major in Electrical Engineering. Current topics in electrical engineering.
- 486 Solid State Device Design and Modeling** 3 (2-3) Course Prerequisite: ECE 349. Design and modeling of solid-state devices such as PN diode, BJT and MOSFET. Simulation and of device design using CAD tools such as ATLAS and ATHENA for physical modeling and fabrication process integration.
- 495 Wireless and Mobile Communications Systems** 3 (2-3) Course Prerequisite: ECE 345; ECE 414; ECE 425. Wireless communication emphasizing cellular and multiple access communication; RF environment, duplexing and multiple access, cellular, mobile systems, standards and applications; wireless ad hoc networks.
- 496 Silicon Integrated Circuit Design Technology** 3 (2-3) Course Prerequisite: ECE 349. Hands-on experience in design, fabrication, characterization, and testing of monolithic silicon devices and integrated circuits; completion of a design project.
- 499 Special Problems** V 1-4 May be repeated for credit. Course Prerequisite: By permission only. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 501 Fundamentals of Laboratory-on-Chip** 3 Operating principles of laboratory-on-chip (LoC) technologies, basics of design and fabrication, integration with microdevices, digital and high-frequency circuits, sensors, and power systems.
- 525 Experimental Methods for Electrical Engineering** 3 Design of experiments; data analysis methods; statistical testing; dynamic measurements; uncertainty analysis, yield concepts; data acquisition; probability distributions; and report writing. Recommended preparation: basic statistics knowledge.
- 533 Advanced Antenna Design** 3 Advanced antenna types and design methods, small antennas, reconfigurable antennas, wideband microstrip antennas, millimeter-wave antennas, phased arrays, design of array feed, mutual coupling, system level implications such as full-duplex and MIMO. Recommended preparation: ECE 370; ECE 471.
- 537 High Frequency Circuit Design** 3 Active microwave components (diodes, transistors); microwave transistor amplifiers; oscillators; mixers; stability criteria and circles; noise in microwave circuits; noise figure. Recommended preparation: ECE 370; ECE 425.
- 543 Advanced Hardware Verification** 3 Contemporary methods of functional hardware verification for complex digital designs, including functional simulation, coverage metrics, event and assertion-based verification, property specification language, and formal verification techniques. Recommended preparation: ECE 324.
- 569 Advanced Power Electronics** 3 Advanced design, analysis, modeling, and verification of applied power electronics and related control systems. Recommended preparation: ECE 327.
- 576 Sensors** 3 (2-3) Classification of sensors, sensing modalities, comparison; figures of merit; sensing parameters; sensor miniaturization; sensor manufacturing; and case study: Pressure sensor, gas sensor, temperature sensor, and biosensor. Required preparation: Circuit analysis.
- 586 Solid State Device Design and Modeling** 3 Design and modeling of solid-state devices such as PN diode, BJT, and MOSFET; Simulation and device design using TCAD tools for physical modeling and fabrication process integration. Recommended preparation: Basic semiconductor physics.
- 702 Master's Special Problems, Directed Study, and/or Examination** V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

MECHANICAL ENGINEERING - VANCOUVER

Enrollment in many upper-level mechanical engineering courses is restricted to certified majors or minors in mechanical engineering.

MECH

101 Introduction to Mechanical Engineering 2 Course Prerequisite: MATH 106 and MATH 108, or concurrent enrollment, or MATH 171 or concurrent enrollment. Introduction to mechanical engineering profession, engineering problem solving, computers in engineering design methods.

103 Engineering Graphics 2 (1-3) Orthographic theory, conventions, and visualization; isometric and oblique pictorials; geometric dimensioning and tolerancing, computer-aided drafting and solid modeling.

211 Statics 3 Course Prerequisite: MATH 172 or 182 or concurrent enrollment; PHYSICS 201 or concurrent enrollment. Static equilibrium analysis of particles and rigid bodies, free-body diagrams, moment diagrams, friction, center of gravity, moments of inertia.

212 Dynamics 3 Course Prerequisite: MECH 211. Kinematics and kinetics of particles and rigid bodies; Newton's second law of motion; work-energy concept; impulse and momentum.

215 Mechanics of Materials 3 Course Prerequisite: MECH 211. Concepts of stress, strain, and their relationships; axial, torsion, bending, and combined stresses; properties of materials; columns and strain energy method.

251 Numerical Computing for Engineers 2 Course Prerequisite: MATH 172 or 182; MATH 220 or concurrent enrollment. Introduction to numerical computing in the context of problem solving including data analysis, data visualization, MATLAB programming and numerical techniques.

301 Thermodynamics 3 Course Prerequisite: PHYSICS 201. Thermodynamic properties of matter, ideal and real gases, work and heat, first and second laws and their application to engineering systems.

303 Fluid Mechanics 3 Course Prerequisite: MECH 212. Physical properties, fluid statics, laminar and turbulent flow, impulse and momentum, similitude, pipe flow, boundary layers, lift, drag and measurement techniques, fluid experimentations. Recommended preparation: MATH 315.

- 304 Instrumentation and Measurement 3** (2-3) Course Prerequisite: MATH 315 or concurrent enrollment; PHYSICS 202. Introduction to DC and AC circuits, analog electronic components, digital circuits, computer data acquisition and engineering measurements.
- 309 [M] Introduction of Engineering Materials 3** (2-3) Course Prerequisite: MECH 215; CHEM 105 or concurrent enrollment; PHYSICS 201 or concurrent enrollment. Structure of materials, phase equilibrium, phase transformations, mechanical failure, and mechanical properties; materials testing laboratory.
- 310 Introduction to Design and Manufacturing 4** (3-3) Course Prerequisite: MECH 103; MECH 309; Certified major in Mechanical Engineering. Basic mechanical engineering drawing; shaping and non-shaping manufacturing processes; exposure to 3D-CAD; manufacturing processes laboratory.
- 314 Machine Design I 3** Course Prerequisite: MECH 215; MECH 309; certified major in Mechanical Engineering. Design process, factor of safety, stress-deformation, combined stresses, curved members; deformation analysis, static and fatigue failure theories; design of mechanical elements, stress analysis and finite elements; shafts and coupling design.
- 348 Dynamics Systems and Control 3** Course Prerequisite: MECH 212; MECH 251; MATH 315; certified major in Mechanical Engineering. Modeling and analysis of dynamic systems, including mechanical, electrical, fluid, and thermal systems. Fundamentals of vibration analysis, control systems.
- 402 Thermal Systems Design 3** (1-6) Course Prerequisite: MECH 404. Design and analysis of thermal-fluid systems using principles of thermodynamics, fluid mechanics, and heat transfer, thermal experimentations.
- 404 Heat Transfer 3** Course Prerequisite: MATH 220; MATH 315; MECH 301; MECH 303; Certified major in Mechanical Engineering. Fundamentals of conduction, convection, and radiation heat transfer; analytical, numerical, and empirical modeling for solids, liquids, and gases.
- 405 Introduction to Microcontrollers 3** Course Prerequisite: MECH 304. Microcontroller architecture, microcontroller programming, mechanical system design with embedded microcontrollers.
- 414 Machine Design II 3** Course Prerequisite: MECH 215; MECH 309; MECH 314; Certified major in Mechanical Engineering. Static and fatigue failure theories applied to design of mechanical elements, stress analysis and finite elements; design for fatigue life of various mechanical elements, design and selection of standard mechanical components, and design of clutches and brakes.
- 416 [M] Mechanical Systems Design I 2** Course Prerequisite: MECH 310; MECH 404; MECH 414 or concurrent enrollment. First term of the year-long capstone design; integrative design in mechanical engineering; multidisciplinary design project considering technical and nontechnical contexts.
- 417 [CAPS] Mechanical Systems Design II 3** Course Prerequisite: MECH 416; junior standing. Second term of the year-long capstone design; integrative design in mechanical engineering; multidisciplinary design project considering technical and nontechnical contexts.
- 431 Semiconductor Devices 3** Course Prerequisite: CHEM 105; PHYSICS 202. Crystal properties, energy bands, semiconductor charge carriers, p-n junctions, field-effect transistors, bipolar junction transistors, optoelectronic devices, integrated circuits.
- 438 Microfabrication Technology 3** Course Prerequisite: CHEM 105; MATH 315; PHYSICS 202. Microelectronic fabrication technology, semiconductor material, diffusion, thermal oxidation, ion implantation, lithography, etching, thin film deposition, CMOS integration and MEMS. Credit not granted for both MECH 438 and MECH 538.
- 441 Fundamentals of Renewable Energy 3** Course Prerequisite: PHYSICS 202; MATH 273. An examination of the fundamentals and the impact of renewable energy technology, including wind, solar, hydroelectricity, and alternate fuels.
- 442 Advanced Thermal Systems 3** Course Prerequisite: MECH 404. Analysis and design of advanced thermal systems at macro, mini and micro scales; applied design software packages; design projects. Credit not granted for both MECH 442 and MECH 542.
- 450 Advanced Topics in Micro and Nano Technology 3** (2-3) Course Prerequisite: CHEM 106; PHYSICS 202. Microfabrication technology, bulk and surface micromachining, sensors and actuators, microelectromechanical systems (MEMS), nanofabrication technology, micro/nano scale material and device measurements. Credit not granted for both MECH 450 and MECH 550.
- 467 Automation 3** (2-3) Course Prerequisite: MECH 304 or ECE 260; MECH 348. Design of automation systems, motion control, programmable logic. Credit not granted for both MECH 467 and MECH 567.
- 468 Robotics 3** Course Prerequisite: MECH 304 or ECE 260; MECH 348. Industrial robots, kinematics, control, robot programming, interfacing, sensors, actuators, vision systems and mobile robots. Credit not granted for both MECH 468 and MECH 568.
- 476 Advanced Manufacturing Engineering 3** Course Prerequisite: MECH 310. Advanced topics in manufacturing processes, including interrelationships between the properties of the material, the manufacturing process and design of components. Credit not granted for both MECH 476 and MECH 576.
- 483 Topics in Mechanical Engineering V 1-4** Current topics in Mechanical Engineering.
- 485 Computer-aided Engineering 3** Course Prerequisite: MECH 215; MECH 310 or concurrent enrollment. Introduction to the use of finite element techniques in engineering product design and analysis; basic concepts and applications in CAE.
- 489 Material Failure in Mechanical Design 3** Course Prerequisite: MECH 215; MECH 309. Analysis, design and prevention from failure of materials in mechanical design; mechanical behavior of materials such as fatigue, fracture and wear. Credit not granted for both MECH 489 and MECH 589.
- 499 Special Problems V 1-4** May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 509 MEMS Engineering 3** (2-3) Introduction to the design, fabrication and application of microelectromechanical systems.
- 515 Advanced Heat Transfer 3** Energy conservation equations; forced convection with internal and external flow, free convection, boiling and condensation, mass transfer, numerical methods.
- 516 Micro/Nanoscale Thermal Engineering 3** Fundamentals and applications of micro/nanoscale thermal science and engineering.
- 521 Fundamentals of Fluids I 3** Mass and momentum conservation equations, Navier-Stokes equations, compressible flows, inviscid-potential flows, advanced viscous flows including boundary layer numerical methods.
- 529 Experimental Methods for Mechanical Engineering Research 3** Research methods for mechanical engineers, including experimental design, techniques, analysis, and presentation.
- 532 Finite Elements 3** Theory of finite elements; applications to general engineering systems considered as assemblages of discrete elements.
- 538 Microfabrication Technology 3** Microelectronic fabrication technology, semiconductor material, diffusion, thermal oxidation, ion implantation, lithography, etching, thin film deposition, CMOS integration and MEMS. Credit not granted for both MECH 438 and MECH 538.
- 540 Advanced Dynamics 3** Newtonian dynamics, rotating coordinate systems; Lagrangian and Hamiltonian mechanics, gyroscopic mechanics, other applications.
- 542 Advanced Thermal Systems 3** Analysis and design of advanced thermal systems at macro, mini and micro scales; applied design software packages; design projects. Credit not granted for both MECH 442 and MECH 542.
- 550 Advanced Topics in Micro and Nano Technology 3** (2-3) Microfabrication technology, bulk and surface micromachining, sensors and actuators, microelectromechanical systems (MEMS), nanofabrication technology, micro/nano scale material and device measurements. Credit not granted for both MECH 450 and MECH 550.

- 567 Automation 3 (2-3)** Design of automation systems, motion control, programmable logic. Credit not granted for both MECH 467 and MECH 567.
- 568 Robotics 3** Industrial robots, kinematics, control, robot programming, interfacing, sensors, actuators, vision systems and mobile robots. Credit not granted for both MECH 468 and MECH 568.
- 576 Advanced Manufacturing Engineering 3** Advanced topics in manufacturing processes, including interrelationships between the properties of the material, the manufacturing process and design of components. Credit not granted for both MECH 476 and MECH 576.
- 579 Advanced Topics in Design and Manufacturing V 1-3** May be repeated for credit.
- 585 Computer-aided Engineering 3** Introduction to the use of finite element techniques in engineering product design and analysis; basic concepts and applications in CAE.
- 589 Material Failure in Mechanical Design 3** Analysis, design and prevention from failure of materials in mechanical design; mechanical behavior of materials such as fatigue, fracture and wear. Credit not granted for both MECH 489 and MECH 589.
- 598 Seminar 1** May be repeated for credit. Current research interests. S, F grading.
- 700 Master's Research, Thesis, and/or Examination V 1-18** May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

Engineering and Technology Management Program

<http://etm.wsu.edu>
ETRL 336
509-335-0125

Program Director, K. D. Zentz; Teaching Faculty: Clinical Associate Professors, W. J. Gray, R. Johnson, L. Magpili, D. Paulus, A. Squires; Adjunct Instructors, R. Crick, J. Pricco.

Engineering and Technology Management is a graduate program designed to help technical professionals become effective managers. The program is administered by the Voiland College of Engineering and Architecture and offered through WSU Global Campus. Management training is integrated with upgraded technical skills to meet industry needs for the management of technology and the management of technical professionals. The program provides an integrated education in technical decision-making and leadership for industry employees and allows business and engineering employees to learn together in common courses. Students bring a significant amount of

experience and diversity into the academic arena from a variety of engineering, technology, and management backgrounds.

This interdisciplinary master's degree is offered to individuals, industries and high-tech firms around the country and around the world using a web conferencing classroom system. Classes are offered at times convenient for the working professional. Each ETM course lecture is broadcast over the Internet giving students real-time, full service videoconferencing capability and the ability to interact with faculty and students in the class. Students can participate in class discussions through audio, video, and text chat. Spontaneous file sharing is also possible. This software is also used for student presentations and virtual meetings for team projects. Each class is archived and is available for review during the entire semester. Courses are presented and managed using a web-enabled course hosting platform. Courses are presented and managed using a web-enabled course hosting platform.

The ETM program also offers seven graduate level certificates: Six Sigma Quality Management; Project Management; Manufacturing Leadership; Constraints Management; Logistics and Supply Chain Management; Systems Engineering Management; and Construction Project Management.

Program Requirements

The master's program is a nonthesis degree which consists of 32-34 credit hours including a minimum of 30 credit hours of approved graded course work (10 classes) and 2-4 credit hours of Master's Special Problems. There is currently both a project and an exam option, however this may be changing to a capstone project in the future. The program of studies leads to a Master of Engineering and Technology Management degree. Core Requirements allow students to choose one course from each of the six core areas: Managing Organizations and People (E M 501, 522), Managing Financial Resources (E M 505, 545), Managing with Analytical Methods (E M 540, 560), Managing Projects (E M 520, 564), Managing Variability (E M 503, 580, 585), and Managing Strategy (E M 526, 575, 591). Four additional courses can be chosen as electives--from any area, both core and elective. Electives include E M 508, 530, 534, 538, 555, 565, 566, 567, 570, 590, 595, 596.

Each certificate requires 12 credits. If students plan their course of studies carefully, they are able to earn certificates simultaneously while earning the master's degree, or by taking a few additional classes.

Admission Requirements

Students who apply to the Master of Engineering and Technology Management degree program will be currently employed in an engineering or technological field and will have earned a bachelor's degree in engineering or technology from an accredited school with a minimum GPA of 3.0. Applicants with undergraduate degrees in other fields, who are working in technical fields, may be accepted for this program if they have sufficient math, basic statistics, and experience in the technological professions. Prospective students must provide email addresses for three individuals willing to write letters of recommendation, a resume showing relevant work experience, and a well-written, three to five paragraph personal statement outlining the appropriateness of the program in light of career goals and work history.

The GMAT is required for qualified students who may not have the required 3.0 GPA. Applications should be submitted a minimum of two months prior to the semester start to allow a careful review of qualifications and processing.

For information about the on-line certificates or master's degree program, please contact the Pullman office at (509) 335-0125 or by email etm@wsu.edu.

Program Mission

The mission of the Engineering and Technology Management Master's Degree Program is to enable students to develop as successful graduates and professionals with advanced technical and management education and skills that allow them to take on leadership roles in globally competitive technological environments and industries.

Student Learning Outcomes

Provide graduates with current management knowledge and tools for:

- Communicating with logical, clear, and organized thinking.
- Behaving ethically and professionally in fulfillment of their responsibilities.
- Recognizing the need for, and demonstrating a desire for continuous learning.

Provide graduates with the expertise and confidence to assume leadership positions in technical environments by successfully:

- Managing and working in teams.
- Demonstrating problem-solving abilities and rational, effective decision-making.

Increase the graduates value to an employer or organization by:

- Applying the ETM principles learned to real world situations.
- Demonstrating the ability to understand, analyze, and improve company practices through the use of current technology, analysis, and design.

Description of Courses

ENGINEERING MANAGEMENT

E M

401 Management of Organizations 3 Exploration of issues related to individual behavior in work organizations, including motivation, leadership, team-building, and team management skills. Credit not granted for both E M 401 and 501.

403 Managing Variability Using Statistics 3 Managing variability and uncertainty using statistics for engineering decision-making involving risk. Credit not granted for both E M 403 and 503.

420 Contract Project Management 3 Contract project bids, proposals, contracts, project delivery/organization; estimating, scheduling, resource loading, project monitoring and controls, safety and quality. Credit not granted for both E M 420 and 520.

422 Leadership, Supervision, and Management 3 Strategies of supervision with practical application techniques presented to create individual and organizational motivation. Credit not granted for both E M 422 and 522.

- 426 Constraints Management 3** Identifies factors that block improvements in any system; effective breakthrough solutions; continual systems improvements for manufacturing, administration, projects. Credit not granted for both E M 426 and E M 526.
- 430 Applications of Constraints Management 3** Understanding and applying proved solutions developed by the theory of constraints in areas of production, project management, finance, and distribution. Credit not granted for both E M 430 and E M 530.
- 438 Lean Agility 3** Integration of the best of Lean, Six Sigma, and Theory of Constraints to accelerate the continuous improvement process. Credit not granted for both E M 438 and 538.
- 460 Integrated Supply Chain Management 3** Course Prerequisite: Junior standing. Concepts and techniques for design and managing manufacturing and service, operations intended to develop a world class organization. Credit not granted for both E M 460 and 560.
- 464 Project Management 3** Technical tools, Critical Path Method (CPM), Program Evaluation Review Technique (PERT), cost/schedule control systems, behavioral issues and organizational structure. Credit not granted for both E M 464 and E M 564.
- 470 Six Sigma Quality Management 3** Quality management programs, quality assurance, statistical quality control concepts and product design reliability. Credit not granted for both E M 470 and 570.
- 480 Quality Control and Reliability 3** Quality analysis, modeling process, product quality, statistical process control, process capability studies; sampling concepts, reality models, predictions, design testing. Credit not granted for both E M 480 and E M 580. Recommended preparation: STAT 430.
- 485 Quality Improvement Using Design of Experiments 3** Design for quality improved products; processes and services using designed experiments, including robust/parameter design. Credit not granted for both E M 485 and E M 585. Recommended preparation: Undergraduate statistics.
- 490 Design for Product and Service Realization 3** Course Prerequisite: Junior standing. Techniques and tools to optimize cost, quality, time to market, and to improve comprehensive product design, manufacturability and service components. Credit not granted for both E M 490 and E M 590.
- 501 Management of Organizations 3** Exploration of issues related to individual behavior in work organizations, including motivation, leadership, team-building, and team management skills. Credit not granted for both E M 401 and 501.
- 503 Managing Variability Using Statistics 3** Managing variability and uncertainty using statistics for engineering decision-making involving risk. Credit not granted for both E M 403 and 503.
- 505 Finance for Technical Systems 3** Time value of money, capital budgeting, accounting principles, cost, valuation, risk, cost accounting and sensitivity analyses: concepts for engineering decision-making.
- 508 Legal Concepts for Engineering and Technical Managers 3** Basic legal obligations of engineering/technical managers; identify, minimize and recognize risks and liability; contemporary legal environment and business law.
- 520 Contract Project Management 3** Contract project bids, proposals, contracts, project delivery/organization; estimating, scheduling, resource loading, project monitoring and controls, safety and quality. Credit not granted for both E M 420 and 520.
- 521 Integrated Project Delivery Methods 3** Understanding the different processes by which the procedures and components of a project are organized to complete the project.
- 522 Leadership, Supervision, and Management 3** Strategies of supervision with practical application techniques presented to create individual and organizational motivation. Credit not granted for both E M 422 and 522.
- 524 Program and Facilities Management 3** An introduction to the methods required for planning, designing, constructing, and operation of the capital resources for an organization's facilities.
- 526 Constraints Management 3** Identifies factors that block improvements in any system; effective breakthrough solutions; continual systems improvements for manufacturing, administration, projects. Credit not granted for both E M 426 and E M 526.
- 530 Applications of Constraints Management 3** Understanding and applying proved solutions developed by the theory of constraints in areas of production, project management, finance, and distribution. Credit not granted for both E M 430 and E M 530.
- 534 Contemporary Topics in Constraints Management 3** May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: E M 526 or 530. Contemporary teaching tools, software packages, current techniques and thought in managing complex systems using the theory of constraints.
- 538 Lean Agility 3** Integration of the best of Lean, Six Sigma, and Theory of Constraints to accelerate the continuous improvement process. Credit not granted for both E M 438 and 538.
- 540 Operations Research for Managers 3** Applying linear, integer, goal programming; network optimization; queuing analysis; dynamic programming; simulation; Markov analysis; and forecasting to engineering management decisions.
- 545 Technical Decision Analysis 3** Decision analysis provides a structured discipline for describing, analyzing, and finalizing decisions involving uncertainty. Recommended preparation: Basic STAT course.
- 555 Enterprise Resource Management 3** Focusing the flow of quality, timely products and cooperative supply chain operations and planning using simulation and effective enterprise resource management.
- 560 Integrated Supply Chain Management 3** Concepts and techniques for design and managing manufacturing and service, operations intended to develop a world class organization. Credit not granted for both E M 460 and 560.
- 564 Project Management 3** Technical tools, Critical Path Method (CPM), Program Evaluation Review Technique (PERT), cost/schedule control systems, behavioral issues and organizational structure. Credit not granted for both E M 464 and E M 564.
- 565 Introduction to Systems Management 3** Design manufacture, operation of complex system development for engineering managers; project planning, organizing, and controlling tools for engineering system constraints.
- 566 System Engineering Analysis and Practice 3** Problem-solving methodologies based on system concepts and design applications for complex, large-scale technical systems pertinent to program managers.
- 567 System Supportability and Logistics Management 3** Supportability and logistics engineering and management in a system life cycle, from concept to retirement.
- 568 Risk Assessment and Management 3** Risk management strategies and techniques for the design and management of engineering and technology systems.
- 570 Six Sigma Quality Management 3** Quality management programs, quality assurance, statistical quality control concepts and product design reliability. Credit not granted for both E M 470 and 570.
- 575 Performance Management in Technical Organizations 3** Management of high technology organizations; planning, measurement, and human factors in improving high technology organizations; productivity, motivation and performance systems.
- 580 Quality Control and Reliability 3** Quality analysis, modeling process, product quality, statistical process control, process capability studies; sampling concepts, reality models, predictions, design testing. Credit not granted for both E M 480 and E M 580. Recommended preparation: STAT 430.
- 585 Quality Improvement Using Design of Experiments 3** Design for quality improved products; processes and services using designed experiments, including robust/parameter design. Credit not granted for both E M 485 and E M 585. Recommended preparation: Undergraduate statistics.
- 590 Design for Product and Service Realization 3** Techniques and tools to optimize cost, quality, time to market, and to improve comprehensive product design, manufacturability and service components. Credit not granted for both E M 490 and E M 590.

591 Strategic Management of Technology and Innovations in Engineering 3

Management of technological innovation; integrating strategy, new product development, corporate entrepreneurship, and innovation; features action-oriented cases.

595 Advanced Topics in Engineering Management I V 1-3 May be repeated for credit; cumulative maximum 9 hours. A wide range of current high-interest engineering management topics.**596 Advanced Topics in Engineering Management II 3** May be repeated for credit; cumulative maximum 9 hours. A wide range of current high-interest engineering management topics.**600 Special Projects or Independent Study V 1-18** May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.**702 Master's Special Problems, Directed Study, and/or Examination V 1-18** May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

Department of English

libarts.wsu.edu/english/
 Avery 202, Pullman campus
 509-335-2581

Associate Professor and Chair, T. Butler; Professors, N. Bell, D. Campbell, P. Chilson, W. Condon, D. Grigar, W. Hamlin, M. Hanly, D. Lee, S. Ross, C. Siegel; Associate Professors, K. Arola, R. Eddy, P. Ericsson, L. Gordon, J. Hegglund, D. Hellegers, W. Johnson, T. Lewis, L. McAuley, P. Narayanan, A. Oforlea, W. Olson, J. Staggers, K. Withey; Assistant Professors, A. Boyd, M. Edwards, R. Whitson; Professors Emeriti, B. Anawalt, P. Brians, J. Burbick, J. Ehrstine, T. Faulkner, D. Gillespie, A. Hammond, D. Hughes, V. Hyde, R. Johnson, G. Kennedy, N. Kiessling, A. Kuo, R. Law, S. Linden, R. McLean, R. Meldrum, B. Monroe, B. Sitko, J. Taylor, A. von Frank.

Majors in English provide students with a broad critical and cultural understanding of literature and literary studies, and emphasize the writing and analytical skills that are vital to success in the university, in professional and graduate school, and in the workplace. The program of study is flexible and allows English majors to focus on particular areas of intellectual interest, to pursue electives, minors, and second majors in other departments, and to shape their academic careers in line with professional and personal interests. The curriculum is designed for (1) students who desire a broad education emphasizing language and literature, (2) students who wish to teach or to prepare for graduate studies in literature

or rhetoric and composition, (3) students who intend to use the background and skills learned in the major as a foundation for careers in writing, editing, law, business, or public service and public relations. The curriculum provides majors the opportunity to complete their studies with a small discussion seminar, internship, or senior project in their area of emphasis.

Majors in English are expected to learn to read literary and cultural texts carefully and critically; to produce a variety of high-quality creative and critical texts using appropriate technologies that contribute to literary and cultural discourses; to develop abilities in critical reading, writing, and thinking necessary to communicate successfully with audiences both within and outside the university; and to explore the record of the human experience in language.

Students who are preparing to teach English in the public schools of Washington should examine the summary of requirements for majors and minors listed in the Department of Teaching and Learning in this catalog, and they should confer with the College of Education concerning the requirements for certification.

The Department of English offers courses of study leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy (English). The department participates in the interdepartmental program in American Studies leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy (American Studies). Students interested in the Bachelor of Arts in this interdisciplinary field should consult the requirements listed under Program in American Studies. English also coordinates the Digital Technology and Culture program, which offers an interdisciplinary course of study leading to the Bachelor of Arts degree. Students interested in this field should consult the requirements listed under Digital Technology and Culture. Students interested in interdisciplinary degrees in areas such as linguistics, humanities, and classical studies should consult the requirements within the Program in General Studies. Students may now also do an English degree consisting primarily of international literature, philosophy, art, architecture, and music courses from the Humanities sequence offered jointly by the departments of Foreign Languages and English, within the Literary Studies option described below.

English Major Options

Four programs are offered for the English major, all leading to the degree of Bachelor of Arts in English.

Option I: Literary Studies is for students who desire a general liberal arts education emphasizing literature, critical thinking, and writing; and for those preparing for graduate education in English or literary studies. English is often selected as a major by students with double majors or minors in other departments.

Option II: Rhetoric and Professional Writing is for students preparing for careers in business, public service, law, or other professions requiring writing and reading skills. It is also suitable for those seeking careers in higher education specializing in rhetoric and composition.

Option III: Teaching is for students who need specific training in the teaching of language and literature at the secondary level; it is coordinated with the Department of Teaching and Learning.

Option IV: Creative Writing is for students interested in creative writing in various forms (poetry, fiction, nonfiction prose), in editing and publishing, and in careers drawing on related creative and professional skills.

Student Learning Outcomes

A graduate in English studies is a creative and critical thinker and writer. An education in English presents students with opportunities to practice reading literary and cultural texts carefully and critically. Students produce a variety of creative and critical texts using appropriate technologies that contribute to literary and cultural discourses. They develop their abilities in critical reading, writing, and thinking necessary for them to communicate successfully with other audiences both within and outside the University. In other words, English majors not only explore the record of human experience in language, but also develop foundational skills necessary to pursue multiple and varied career paths. For more information, please see <http://english.wsu.edu/undergraduate-studies.html>.

Digital Technology and Culture

Digital Technology and Culture is an interdisciplinary degree program that integrates humanities, social sciences, and technology in a critical and creative framework designed to meet individual student interests as well as the needs of contemporary audiences and employers. Digital Technology and Culture majors work at the frontier of today's technology, while learning the importance of technological history and preparing themselves to live in and understand a culture increasingly influenced by digital technology. If you are interested in mixing art and technology, in language and culture, and in persuasion and effective communication then DTC is the major for you. For further information, consult the separate entry for "Digital Technology and Culture."

Preparation for Graduate Study

Students interested in a graduate program in English at Washington State University should pursue preparation in English courses generally approximating one of the first three undergraduate programs described above. Students with undergraduate majors in such subjects as philosophy, foreign languages, and history may also be accepted for graduate study in the department. Students preparing for degrees which require a foreign language reading competency should begin studying a qualifying language before entering graduate school. See the "Language Requirements" page on the Department of English Graduate Studies Web site for further details: <https://english.wsu.edu/graduate-studies/>.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

I. ENGLISH - LITERARY STUDIES OPTION (120 HOURS)

Requirements in this degree include 15 hours of core classes, 15 hours 300-400-level English literature or

Humanities classes, including at least 6 hours at the 400 level, and 6 hours of electives in English or Humanities at any level, including a Writers of Color course and excluding ENGLISH 201.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
HISTORY 105 [ROOT]	3
Humanities [HUM] ²	3
Quantitative Reasoning [QUAN]	3
Electives	4
<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4
Social Sciences [SSCI]	3
Electives	3

Second Year

<i>First Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
HUMANITY Elective ²	3
Electives	3
<i>Second Term</i>	<i>Hours</i>
Diversity [DIVR]	3
Two from ENGLISH 370, 371, 372, or 373	6
Electives	6
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
ENGLISH 302 [M]	3
Two from ENGLISH 370, 371, 372, or 373	6
300-400-level Literature or Humanities Elective ³	3
Foreign Language, if necessary, or Elective	3 or 4
<i>Second Term</i>	<i>Hours</i>
300-400-level Literature or Humanities Electives ³	6
Foreign Language, if necessary, and/or Electives	12

Fourth Year

<i>First Term</i>	<i>Hours</i>
ENGLISH 494 or 400-level Literature or Humanities Elective ⁴	3
Writers of Color Course ⁵	3
300-400-level Literature or Humanities Elective ³	3
300-400-level Electives	6
Complete English Portfolio	
<i>Second Term</i>	<i>Hours</i>
ENGLISH 494 or 400-level Literature or Humanities Elective ⁴	3
Integrative Capstone [CAPS]	3
Electives	6

with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

²Humanities Electives: At least one from HUMANITY 101, 103, 302 [M], 303, 304, 335, 350, 410, or 450 is required. Upper-division HUMANITY courses are not recommended for first-year students.

³Literature or Humanities Electives: Approved courses include ENGLISH 305, 306, 309, 311, 314, 315, 317, 321, 322, 332, 341, 366, 370, 371, 372, 373, 382, 409, 419, 470, 480-489; HUM 302 [M], 304, 335, 350, 410, 450. May need to include [M] course to meet University Requirements.

⁴Approved courses include ENGLISH 409, 419, 470, 480-489, HUM 410, 450, or as approved by advisor.

⁵Writers of Color Courses: Choose from ENGLISH 311, 314 [M], 315, 321, 322 [M], 341 [M], 345 [M], or 489.

II. ENGLISH - RHETORIC AND PROFESSIONAL WRITING OPTION (120 HOURS)

Requirements in this degree are a core of eighteen hours of 300-400-level classes, eighteen hours of electives from the list of approved courses, with the option of six credits – with the approval of advisor – of any English or Humanities course at any level.

First Year

<i>First Term</i>	<i>Hours</i>
ENGLISH 101 [WRTG]	3
Humanities [HUM] ¹	3
Quantitative Reasoning [QUAN]	3
Social Sciences [SSCI]	3
Foreign Language, if necessary, or Elective	4

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
HISTORY 105 [ROOT]	3
Foreign Language, if necessary, and/or Electives	9

Second Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ²	4
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
ENGLISH 301 [WRTG]	3
Humanities Elective ¹	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
Diversity [DIVR]	3
ENGLISH 360	3
ENGLISH 362	3
ENGLISH 370, 371, 372, or 373	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ²	4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
English 302 [M]	3

300-400-level Rhetoric / Professional Writing Electives ³	6
Electives	6

<i>Second Term</i>	<i>Hours</i>
300-400-level Rhetoric / Professional Writing Electives ³	6
Electives	9

Fourth Year

<i>First Term</i>	<i>Hours</i>
300-400-level Rhetoric / Professional Writing Electives ³	6
300-400-level Electives	6
Complete English Portfolio	

<i>Second Term</i>	<i>Hours</i>
ENGLISH 460 [M] or 461 [M] ⁴	3
Integrative Capstone [CAPS]	3
Electives	9

¹Humanities Electives: At least one from HUMANITY 101, 103, 302 [M], 303, 304, 335, 350, 410, or 450 is required. Upper-division HUMANITY courses are not recommended for first-year students.

²To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

³Rhetoric / Professional Writing Electives: Choose from AMER ST 475, CES 405, DTC 336, 354, 355 [M], 375 [M], 476, ENGLISH 308 [M], 358, 361, 363, 401, 402 [M], 405, 458, 461 [M], and 495.

⁴Prerequisite of ENGLISH 402 [M] or 403 [M] required for ENGLISH 461 [M].

III. ENGLISH - CREATIVE WRITING OPTION (120 HOURS)

Requirements in this option involve a minimum of 45-credit hours, approximately half in creative writing and related professional courses, the remainder in supporting literature courses approved by the advisor. In addition to these requirements, students are urged to select UCORE courses in American and world cultures, history, and society to round out the liberal arts education that they will bring to careers in creative writing, editing, publishing, and related fields.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
ENGLISH 101 [WRTG]	3
Humanities [HUM] ²	3
Quantitative Reasoning [QUAN]	3
Foreign Language, if necessary, or Elective	3 or 4

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
ENGLISH 251	3
HISTORY 105 [ROOT]	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4
Foreign Language, if necessary, or Elective	3 or 4

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course

Second Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
ENGLISH 351 or 353	3
Social Sciences [SSCI]	3
Electives (literature courses recommended)	7
<i>Second Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
Diversity [DIVR]	3
ENGLISH 352	3
300-400-level Literature Elective ³	3
Humanities Electives ²	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
ENGLISH 302 [M]	3
ENGLISH 357, 402 [M], 498, OR 499	3
300-400-level Literature Elective ³	3
Electives	6
<i>Second Term</i>	<i>Hours</i>
ENGLISH 451 [M], 452 [M], or 453	3
Writers of Color Course ⁴	3
300-400-level Electives	9

Fourth Year

<i>First Term</i>	<i>Hours</i>
Integrative Capstone [CAPS]	3
300-400-level Creative Writing or Literature Elective ⁵	3
400-level Literature Elective ³	3
300-400-level Electives	6
Complete English Portfolio	
<i>Second Term</i>	<i>Hours</i>
ENGLISH 446	3
ENGLISH 451 [M], 452 [M], or 453	3
300-400-level Creative Writing or Literature Elective ⁵	3
Electives	3

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² Humanities Electives: At least one from HUMANITY 101, 103, 302 [M], 303, 304, 335, 350, 410, or 450 is required. Upper-division HUMANITY courses are not recommended for first-year students.

³ Literature Electives: Approved courses include ENGLISH 305, 306, 309, 311, 314, 315, 317, 321, 322, 332, 341, 366, 370, 371, 372, 373, 382, 409, 419, 470, and 480-489.

⁴ Writers of Color Courses: Choose from ENGLISH 311, 314 [M], 315, 321, 322 [M], 341 [M], 345 [M], or 489.

⁵ Approved courses include any 300-400-level ENGLISH courses not used to fulfill other requirements.

IV. ENGLISH - TEACHING OPTION WITH CERTIFICATION (120 HOURS)**First Year**

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
ENGLISH 101 [WRTG]	3
Humanities [HUM]	3
Foreign Language, if necessary, or Elective	3 or 4
<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
HISTORY 105 [ROOT]	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4
Quantitative Reasoning [QUAN]	3
Foreign Language, if necessary, or Elective	3 or 4

Second Year

<i>First Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
Diversity [DIVR]	3
ENGLISH 301 or 302 [M]	3
Social Sciences [SSCI]	3
<i>Second Term</i>	<i>Hours</i>
American Literature Elective ²	3
ENGLISH 305 or 306	3
ENGLISH 325	3
ENGLISH 326	3
English or Humanities Elective ³	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
ENGLISH 324 [M]	3
English Literature Elective ⁴	3
English or Humanities Elective ³	3
TCH LRN 301	3
Writers from Marginalized Groups Elective ⁵	3
Apply to College of Education Teacher Certification Program	
<i>Second Term</i>	<i>Hours</i>
ENGLISH 323	3
Integrative Capstone [CAPS]	3
TCH LRN 317	2
TCH LRN 464	3
TCH LRN 465	3
TCH LRN 466	2

Fourth Year

<i>First Term</i>	<i>Hours</i>
ED PSYCH 468	3
English or Humanities Elective ³	3
TCH LRN 467 [M]	3
TCH LRN 469	2
TCH LRN 470	3
<i>Second Term</i>	<i>Hours</i>
TCH LRN 415	16

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course

with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² American Literature Elective: Choose from ENGLISH 210, 368, 371, 372, 470, 480, 481, or 482.

³ English or Humanities Elective: At least one from HUMANITY 101, 103, 302 [M], 303 [M], 304 [M], 335, 350, 410, or 450 is required. Other approved courses include ENGLISH 210, 366, 368, 370, 371, 372, 373, 419, and 480-489 not used to fulfill other major requirements.

⁴ English Literature Elective: Choose from ENGLISH 366, 370, 373, 419, 483, 484, 485, 486, 487, 488, 489, HUMANITY 302 [M], 303 [M], 304, 335, 338, 350, 410, or 450.

⁵ Writers from Marginalized Groups Elective: Choose from ENGLISH 309, 311, 314 [M], 317, 321, 322 [M], 341 [M], 345 [M], or 409.

V. ENGLISH - TEACHING WITHOUT CERTIFICATION OPTION (120 HOURS)**First Year**

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3
Humanities [HUM]	3
<i>Second Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
HISTORY 105 [ROOT]	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4
Quantitative Reasoning [QUAN]	3
Social Sciences [SSCI]	3

Second Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
Diversity [DIVR]	3
ENGLISH 301 or 302 [M]	3
Electives	6
<i>Second Term</i>	<i>Hours</i>
American Literature Elective ²	3
ENGLISH 305 or 306	3
ENGLISH 326	3
Electives	6
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
ENGLISH 325	3
English or Humanities Electives ³	3
Writers from Marginalized Groups Elective ⁴	3
Electives	6
<i>Second Term</i>	<i>Hours</i>
ENGLISH 324 [M]	3
English or Humanities Electives ³	3
Integrative Capstone [CAPS]	3
300-400-level Electives	6

Fourth Year

<i>First Term</i>	<i>Hours</i>
ENGLISH 323	3
English or Humanities Electives ³	3
300-400-level Electives	9
<i>Second Term</i>	<i>Hours</i>
English Literature Elective ⁵	3
Electives	13

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² American Literature Elective: Choose from ENGLISH 210, 368, 371, 372, 470, 480, 481, or 482.

³ English or Humanities Elective: At least one from HUMANITY 101, 103, 302 [M], 303 [M], 304 [M], 335, 350, 410, or 450 is required. Other approved courses include ENGLISH 210, 366, 368, 370, 371, 372, 373, 419, and 480-489 not used to fulfill other major requirements.

⁴ Writers from Marginalized Groups Elective: Choose from ENGLISH 309, 311, 314 [M], 317, 321, 322 [M], 341 [M], 345 [M], or 409. Students should consider the University requirement of two [M] courses when selecting course.

⁵ English Literature Elective: Choose from ENGLISH 366, 370, 373, 419, 483, 484, 485, 486, 487, 488, 489, HUMANITY 302 [M], 303 [M], 304, 335, 338, 350, 410, or 450.

Minors**Creative Writing**

The Creative Writing minor requires a minimum of 16 credits. Required courses include ENGLISH 251 or 252; 9 credits to be chosen from ENGLISH 351, 352, 353, 354, 355, 357, 358, 359, 446, 451, 452, 453; 3 credits of any 300-400 level ENGLISH course; and 1 credit of ENGLISH 357, 498, 499. Credit hours for the minor must include 9 hours of upper division coursework must be taken in residence and WSU or through WSU-approved education abroad or educational exchange courses.

English

The student must complete a minimum of 18 hours in English courses (excluding 101 and 198), half of which must be 300-400-level and taken in residence at WSU or through WSU-approved education abroad or educational exchange courses; ENGLISH 302 is required.

Humanities

The Department of English administers the Humanities minor. For details, see the separate entry under "Humanities."

Linguistics

The student must complete 18 hours, half of which must be 300-400-level, in the following courses: For

Lang 101 or ENGLISH 256; ENGLISH 255 or PHIL 201; ENGLISH 443 (phonology); ENGLISH 444 (syntax); and two from ENGLISH 454, ENGLISH 456 (language acquisition), ENGLISH 457 (sociolinguistics), ENGLISH 458 (topics in linguistics), ANTH 350, PSYCH 492, or PHIL 443. 9 hours of upper-division work must be taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Professional Writing

The professional writing minor requires 18 hours, half of which must be 300-400-level and taken in residence at WSU or through WSU-approved education abroad or educational exchange courses, and include ENGLISH 301, 402 or 403 and 461. In addition, 12 hours from ENGLISH 255, 256, 300, 354, 355, 401, 402, 403, 405, 478 and 498 are required.

Certificates**Editing and Publishing Certificate**

This career-oriented program equips students with a working, practical knowledge in the creative and professional fields of editing and publishing. To earn the certificate, students must complete the following three core courses: ENGL 355, 357, and 405 (9 credits), plus one (3 credit) elective from the following: ENGL 451, 452, 453, or 477. Students must also complete two 1-credit internships from a slate of approved editorial-based positions. The capstone course is a 1-credit directed study approved by the student's advisor. Students must complete all coursework with a 3.0 GPA or better.

Professional Science and Technology Writing Certificate

To earn the Professional Science and Technology Writing Certificate, students must complete ENGLISH 301, 402, and 495, and two electives from ANIM SCI 280, 285, ANTH 260, 309, BIOLOGY 110, 125, 135, 330, 393, 394, 401, BIOLOGY/WOMEN ST 407, CES 465, ENTOM 150, ENVR SCI 275, 285, 335, ENVR SCI/NATRS 438, FS 201, GEOLOGY 210, HISTORY 381, 382, HORT 150, MATH 398, MBIOS 320, NATRS 312, PHIL 350, 365, 370, PSYCH 320, 401, 403, PSYCH/WOMEN ST 324, SOC 333, SOIL SCI 360, or STAT 205. All coursework must be completed with a 3.00 GPA or higher. The certificate can be earned through the Global Campus and/or on-campus offerings. The university undergraduate certificate fee will apply.

Professional Writing Certificate

To earn the Professional Writing Certificate, students must complete the following five courses with a 3.0 GPA or better: ANTH 350, ENGLISH 301, 355, 402, and 498. ENGLISH 498 must be taken only after the other four courses have been completed. The certificate can be earned through the Global Campus and/or on-campus offerings. The university undergraduate certificate fee will apply.

Teaching English as a Foreign Language Certificate

To earn the Teaching English as a Foreign Language Certificate, students must complete 18 hours including the following courses: ENGLISH 443, 444, 456, 457, ENGLISH 495 or FOR LANG 440, and ENGLISH 498. ENGLISH 255 is highly recommended.

Description of Courses**ENGLISH****ENGLISH****100 Introductory College Composition 3**

Course Prerequisite: Appropriate Writing Exam score. Designed to introduce students to writing and reading in the university. S, F grading.

101 [WRTG] College Composition 3

Course Prerequisite: Appropriate Writing Exam score or completion of ENGLISH 100 with an S grade. Designed to further develop students' academic writing, critical thinking, rhetorical strategies, reading and library skills. Credit not granted for more than one of ENGLISH 101 and 105.

102 Writing Tutorial 1 (0-3)

May be repeated for credit; cumulative maximum 5 hours. Student-centered group tutorial focusing on writing improvement usually connected to the ENGLISH 101 course. S, F grading.

104 Introductory Composition for Multilingual Writers 3

Course Prerequisite: Appropriate Writing Exam score. Designed to introduce non-native speakers of English to writing and reading in the university.

105 [WRTG] College Composition for Multilingual Writers 3

Course Prerequisite: Appropriate Writing Exam score, or ENGLISH 104 with a C or better. Designed to further develop academic writing, critical thinking, reading, library skills, and rhetorical strategies for non-native speakers of English. Credit not granted for more than one of ENGLISH 101 and 105.

106 [COMM] Communicating in Academic Contexts 3

Designed to help improve listening and speaking skills for better participation in academic interactions across campus. For ESL students.

107 Writing Tutorial for Multilingual Writers 1 (0-3)

May be repeated for credit; cumulative maximum 5 hours. Student-centered group tutorial focusing on writing improvement usually connected to the ENGLISH 105 course. S, F grading.

108 [HUM] Introduction to Literature 3

Reading short stories, novels, plays, and poetry by diverse voices; role of conventions, culture, history in interpretation of literature. Credit not granted for both ENGLISH 108 and 199.

110 [HUM] Reading Now 3

Contemporary writing including fiction, poetry, creative nonfiction and graphic novels.

- 150 Introduction of Film as Narrative 3** (2-3) Introduction to analysis of techniques and elements of narrative film and to critical vocabulary for its study as art form.
- 199 English Composition and Literature Honors 3** Open to students only in the Honors College. Credit not granted for both ENGLISH 108 and 199.
- 200 Expository Writing V 1-2** Course Prerequisite: Sophomore standing. For transfer students who need to make up writing credits.
- 201 [WRTG] Writing and Research 3** Course Prerequisite: ENGLISH 101, 105, or 298. Designed to develop students' researching skills for writing across the disciplines.
- 202 Grammar in Context 1** May be repeated for credit; cumulative maximum 5 hours. Tutorial to assist students in mastering conventions of Standard Edited American English. Assigned tutorials in the WSU Writing Center. S, F grading.
- 205 [HUM] Introduction to Shakespeare 3** Shakespeare plays with emphasis on stage productions and film adaptations in various cultural contexts.
- 210 [HUM] Readings in American Literature 3** Selected works by diverse voices from different eras of American literature; importance of conventions, cultural contexts, for interpretation and understanding.
- 211 [HUM] Sex Matters: Introduction to Queer Culture and Literature 3** Introduction to Lesbian/queer cultural production focusing on popular culture, fiction, and film; work from various queer communities in its cultural/historical context. (Crosslisted course offered as WOMEN ST 211, ENGLISH 211).
- 216 Introduction to American Cultural Studies 3** Introduction to the interdisciplinary study of American cultures and the field of American studies. (Crosslisted course offered as AMER ST 216, ENGLISH 216, HISTORY 216, WOMEN ST 216).
- 220 [HUM] Introduction to Multicultural Literature 3** Survey of multicultural literature including European American, African American, Asian American, Chicana/o, and Native American authors. (Crosslisted course offered as CES 220, ENGLISH 220).
- 222 World Literature in English 3** Literature in English from such regions as Africa, Asia, and the Caribbean.
- 251 Introduction to Creative Writing: Exploring the Genres 3** Beginning writer's workshop covering short fiction, creative nonfiction, and poetry with discussion of the elements of each genre; poetic forms.
- 252 Introduction to Creative Writing and Creative Writing Pedagogy 3** Beginning workshop with discussion and development of classroom approaches to three creative writing genres for the preprofessional secondary English teacher.
- 255 English Grammar 3** Introduction to the terms, concepts, and analytical methods of traditional English grammar.
- 256 Introduction to Linguistics 3** Technical introduction to sound, meaning, and structure of words and sentences in natural languages.
- 298 [WRTG] Writing and Research Honors 3** Course Prerequisite: Must be an Honors student. Critical thinking, research, and advanced writing for Honors College students.
- 299 Writing Tutorial for Honors Students 1** (0-3) May be repeated for credit; cumulative maximum 5 hours. Course Prerequisite: Must be an Honors student. Student-centered group tutorial focusing on writing improvement usually connected to the ENGLISH 298 course. S, F grading.
- 300 Computers in English 1** (0-3) May be repeated for credit; cumulative maximum 6 hours. Use of computers in the writing process and in the analysis of literature. S, F grading.
- 301 [WRTG] Writing and Rhetorical Conventions 3** Course Prerequisite: ENGLISH 101, 105, or 298. Designed to provide students with advanced practice in and study of style, argument, and other rhetorical/discourse conventions.
- 302 [M] Introduction to English Studies 3** Course Prerequisite: ENGLISH 101 or 298. Interpretation of texts in several fields of English studies including rhetoric, literary study, creative writing and professional writing.
- 303 Revision Workshop - ESL 3** Course Prerequisite: Completion of written communication proficiency course [W] or [WRTG]. Appreciation of writing processes and revision for speakers of English as a second or foreign language, including self-assessment, developing rhetorical approaches, diagnosing and solving consistent problems, editing, and proofreading strategies.
- 304 Revision Workshop 3** Course Prerequisite: By permission only. Appreciation of writing processes and revision, including self-assessment, developing rhetorical approaches; diagnosing and solving consistent problems, editing, and proofreading strategies.
- 305 [HUM] Shakespeare 3** Shakespearean drama to 1600.
- 306 Shakespeare 3** Shakespearean drama after 1600.
- 307 [M] Historicized Analysis of Literature 3** Course Prerequisite: ENGLISH 302 or concurrent enrollment. Introduction to analyzing literary texts in relation to literary and cultural history.
- 308 [M] Introduction to Literary Criticism 3** Introduction to the systematic study of critical and theoretical approaches to literature; emphasis on problems of interpretation. (Crosslisted course offered as ENGLISH 308, WOMEN ST 306).
- 309 Women Writers 3** Women's artistic and intellectual contributions to prose, fiction, drama, and poetry. (Crosslisted course offered as ENGLISH 309, WOMEN ST 309).
- 311 [HUM] Asian Pacific American Literature 3** Asian American fiction, drama, poetry, and other arts, 1900 to present; impact of Asian/Pacific American culture and experience upon these works. (Crosslisted course offered as CES 313, ENGLISH 311).
- 314 [M] Topics in Asian Pacific American Literature 3** May be repeated for credit; cumulative maximum 6 hours. Trends, themes, major writers. (Crosslisted course offered as CES 314, ENGLISH 314).
- 315 [M] Asian Pacific American Autobiography 3** Critical readings of the autobiographical works, memoirs, and life writings by Asian Pacific Americans. (Crosslisted course offered as CES 315, ENGLISH 315).
- 316 South Asian Film 3** (2-3) Exploration of films by directors in South Asia and in the South Asian diaspora.
- 317 Gay and Lesbian Literature 3** Gay and lesbian literature with focus on the history of homosexual literature and exploration of current authors. (Crosslisted course offered as ENGLISH 317, WOMEN ST 317).
- 321 African American Literature 3** Introduction to major issues and major works in the African American literary tradition. (Crosslisted course offered as CES 331, ENGLISH 321).
- 322 [DIVR] [M] Topics in African American Literature 3** May be repeated for credit; cumulative maximum 6 hours. Trends and major writers. (Crosslisted course offered as ENGLISH 322, CES 332).
- 323 Approaches to the Teaching of English 3** Literature and language arts in secondary schools.
- 324 [M] Rhetoric and Composition for Teaching 3** Rhetoric, composition grammar, and assessment for secondary teaching.
- 325 Young Adult Literature 3** Issues in literature written for young adults and strategies for teaching the genre in secondary schools.
- 326 Applied Grammar for Teachers 3** Application of traditional English grammar for K-12 teachers, with focus on edited, American, African American, vernacular, and Spanish-influenced Englishes.
- 332 [M] Topics in Literature 3** May be repeated for credit; cumulative maximum 6 hours. Special topics in fiction, poetry, drama, or creative nonfiction.
- 336 Composition and Design 3** Course Prerequisite: DTC 201. Design practices and process for composing for a multimedia environment including color, pattern and shape. (Crosslisted course offered as DTC 336, ENGLISH 336).
- 337 Experimental Animation 3** (2-2) Digital and analog animation techniques; conceptual development of narrative structures. (Crosslisted course offered as ENGLISH 337, FINE ART 337).
- 338 [M] Topics: Major Trends and Figures 3** May be repeated for credit; cumulative maximum 6 hours. Literary trends or major writers.

- 339 [ARTS] Topics in Film as Literature 3** (2-3) May be repeated for credit; cumulative maximum 6 hours. Analytical study of film as major literary genre.
- 340 Science Fiction Film 3** (2-3) Major science fiction films and the literature which inspired them.
- 341 [M] Native American Literature 3** Native American literature, by and about the original inhabitants, image and counter-image, with emphasis on the 20th century. (Crosslisted course offered as CES 373, ENGLISH 341).
- 342 [ARTS] Documentary Film Theory and Production 3** (2-2) Theory of documentary film in social contexts culminating in the creation of actual documentary films by students.
- 345 [M] Chicana/o - Latina/o Literature 3** Chicana/o and Latina/o literature, narrative, novel, autobiography, poetry, short story, and drama. (Crosslisted course offered as CES 353, ENGLISH 345).
- 351 Creative Writing: Prose 3** May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: ENGLISH 251 or 252. Workshop approach to writing prose.
- 352 Creative Writing: Poetry 3** Course Prerequisite: ENGLISH 251 or 252. Workshop approach to poetry writing.
- 353 Creative Writing: Nonfiction 3** Course Prerequisite: ENGLISH 251 or 252. Writing literary nonfiction: practice and theory.
- 354 Digital Storytelling 3** Nonlinear, multi-linear, and interactive narrative using elements of creative writing such as character, dialog, setting, plot and image. (Crosslisted course offered as DTC 354, ENGLISH 354).
- 355 [M] Multimedia Authoring: Exploring New Rhetorics 3** Writing for new computer-based media; multimedia authoring project; examination of new rhetorics of information technology. (Crosslisted course offered as DTC 355, ENGLISH 355).
- 356 Information Structures 3** Course Prerequisite: DTC 101. Social and cultural role of information; research with electronic sources; production, validation, storage, retrieval, evaluation, use, impact of electronic information. (Crosslisted course offered as DTC 356, ENGLISH 356).
- 357 Literary Editing and Publishing 3** May be repeated for credit; cumulative maximum 6 hours. Personal and collaborative editing for literary publication; practices of style; macro- and micro-editing.
- 358 Workshop Topics in Writing, Teaching, Literature 1** May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Junior standing. An intensive, time-limited workshop, offered by visiting writers, scholars, and other experts, in topics of special interest. S, F grading.
- 359 Topics in Creative Writing 3** May be repeated for credit; cumulative maximum 9 hours. Course Prerequisite: ENGLISH 251 or 252. Specialized topics in creative writing.
- 360 Principles of Rhetoric 3** Basic concepts and approaches to the art of persuasion.
- 361 Everyday Rhetorics 3** Rhetorics as language and image of popular culture.
- 362 [DIVR] Rhetorics of Racism 3** The language of racism since WWII.
- 363 Rhetoric: Literacy, Power and Agency 3** Major discussions on literacy emphasizing the historical, social, linguistic and pedagogical.
- 364 Legal Writing 3** Introduction to the American legal system and the style, arguments and accepted forms of professional writing in this discipline.
- 366 [HUM] The British Novel to 1900 3** Exploration of the diverse themes, social contexts, and intellectual backgrounds of the novel and novel reading in Britain to 1900.
- 368 [HUM] The American Novel to 1900 3** Classic American novels in cultural perspective by such authors as Cooper, Hawthorne, Melville, Stowe, Twain, James, Jewett, Chopin, Crane, Dreiser.
- 370 The Making of English: Literature, Language and Culture Before 1600 3** Literature before 1600, highlighting the making of English through its interaction with other cultures/languages including Anglo-Saxon.
- 371 17th and 18th Century Transnational Literature in English 3** Literary and cultural texts in English from 1600 to 1800 including British and colonial American literatures within their transnational contexts.
- 372 [HUM] 19th Century Literature of the British Empire and the Americas 3** Literary and cultural texts in English from 1800 to 1900 focusing on global British literature and literatures of the Americas.
- 373 20th and 21st Century Global Literatures in English 3** Literary and cultural texts in English from 1900 to the present focusing on literatures representing the complex processes of globalization.
- 375 [M] Language, Texts and Technology 3** Course Prerequisite: DTC 101. Relationship between technology and communication; writing practices from a historical point of view. (Crosslisted course offered as DTC 375, ENGLISH 375).
- 401 History of Rhetoric 3** Survey of influential theories of rhetoric, ancient to modern.
- 402 [WRTG] [M] Technical and Professional Writing 3** Course Prerequisite: ENGLISH 101 or 298; junior standing. Research writing: defining, proposing, reporting progress; presenting a final product; other professional writing needs. Credit not granted for both ENGLISH 402 and 403.
- 403 [WRTG] [M] Technical and Professional Writing ESL 3** Course Prerequisite: ENGLISH 101 or 105; junior standing; pass University Writing Portfolio. For non-native speakers of English. Special grammatical and rhetorical problems. Credit not granted for both ENGLISH 402 and 403.
- 405 Advanced Professional Writing and Editing 3** Course Prerequisite: ENGLISH 402. Other background may substitute. See department. Professional writing and editing; textual alterations, design, and layout, including internship experience.
- 409 Women Writers in the American West 3** Course Prerequisite: Junior standing. Diversity of writings by women in the trans-Missouri West from the 1890s to the present. (Crosslisted course offered as ENGLISH 409, WOMEN ST 409).
- 410 [CAPS] Cultural Criticism and Theory 3** Course Prerequisite: Junior standing. Major critiques and theories of colonialist and imperialist formations of culture. (Crosslisted course offered as CES 405, ENGLISH 410).
- 415 [CAPS] Traditions of Comedy and Tragedy 3** Course Prerequisite: Junior standing. Study of tragedy and comedy in the Age of Shakespeare.
- 419 The Twentieth Century Novel 3** Course Prerequisite: Junior standing. The novel in English in the literary and cultural context of the modern age.
- 435 Advanced Animation 3** (2-2) Course Prerequisite: DTC 335. Advanced investigation of tools and methods for 2D and 3D digital animation. (Crosslisted course offered as DTC 435, ENGLISH 435).
- 443 Phonology 3** Technical introductions to the analysis of the sound systems of human languages. Credit not granted for both ENGLISH 443 and 543. Cooperative: Open to UI degree-seeking students.
- 444 Syntax 3** Technical introduction to the generative analysis of sentence structure with a focus on English. Credit not granted for both ENGLISH 444 and 544.
- 446 Form and Theory in Creative Writing: Prose and Poetry 3** Course Prerequisite: One of following: English 351, 352, 353, or 359. Formal elements of fiction, creative nonfiction, poetry for creative writing students; analysis of contemporary applications of traditional and experimental techniques.
- 451 [M] Advanced Creative Writing: Fiction 3** May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: One of following: English 351, 352, 353, or 359. Advanced workshop in writing fiction or creative nonfiction prose.
- 452 [M] Advanced Creative Writing: Poetry 3** May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: One of following: English 351, 352, 353, or 359. Workshop approach to poetry writing for the advanced student.
- 453 Advanced Creative Writing: Nonfiction Prose 3** May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: One of following: English 351, 352, 353, or 359. Advanced workshop in writing creative nonfiction prose.

- 454 History of the English Language 3** Language related to the origin, history, and literature of its speakers. Credit not granted for both ENGLISH 454 and ENGLISH 554.
- 456 [M] Language Acquisition 3** Theories and processes of first, second, and bilingual language acquisition.
- 457 Sociolinguistics 3** Study of language in social context and its relationship to social structures.
- 458 Topics in Linguistics 3** May be repeated for credit; cumulative maximum 6 hours. Topics in the structure, use, and function of language.
- 460 [M] The Scope of Rhetoric 3** Major themes in contemporary rhetoric.
- 461 [M] Theory and Practice in Technical and Professional Writing 3** Course Prerequisite: ENGLISH 402 or 403. Practices in technical and professional writing and the theories that challenge and/or legitimize those practices.
- 470 Literature and Culture of the American West 3** May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Junior standing. Cultural exploration of American West in written texts; outsider and insider versions of reality and imagination of its diverse peoples. (Crosslisted course offered as ENGLISH 470, AMER ST 470).
- 472 Ecological Issues and American Nature Writing 3** Course Prerequisite: Junior standing. Representation of nature in American fiction and nonfiction; role of culture in shaping environmental problems and solutions. (Crosslisted course offered as AMER ST 472, ENGLISH 472).
- 475 Digital Diversity 3** Course Prerequisite: Junior standing. Cultural impact of electronic media, especially the World-Wide Web; issues of race, class, gender, sexuality online. (Crosslisted course offered as AMER ST 475, DTC 475, ENGLISH 475).
- 476 Digital Literacies 3** Course Prerequisite: DTC 375. Development and use of new literacies as they affect communication through technology. (Crosslisted course offered as DTC 476, ENGLISH 476).
- 477 Advanced Multimedia Authoring 3** Course Prerequisite: DTC or ENGLISH 355. Advanced writing, imaging and teamwork skills for authoring in new computer-based media; website project in client-oriented context. (Crosslisted course offered as DTC 477, ENGLISH 477).
- 478 Usability and Interface Design 3 (0-6)** Course Prerequisite: DTC or ENGLISH 355. Design of websites using best practices of visual literacy, interface architecture and usability. (Crosslisted course offered as DTC 478, ENGLISH 478).
- 480 American Literature: Beginnings to 1865 3** Course Prerequisite: ENGLISH 302. Advanced study of major authors and movements from the period including Bradstreet, Wheatley, Franklin, Douglass, Poe, Emerson, and Hawthorne.
- 481 American Literature: 1865-1940 3** Course Prerequisite: ENGLISH 302. Advanced study of major authors and movements from the period including Whitman, Dickinson, Twain, Wharton, James, Hemingway, Faulkner, and Wright.
- 482 American Literature: 1940-Present 3** Course Prerequisite: ENGLISH 302. Advanced study of major authors and movements from the period including O'Connor, Bellow, Salinger, Baldwin, Pynchon, Morrison, Tan, and Alexie. (Crosslisted course offered as ENGLISH 482, WOMEN ST 382).
- 483 Chaucer and Medieval Literature 3** Course Prerequisite: ENGLISH 302. Advanced study of Chaucer's *Canterbury Tales* in the context of Medieval culture and literary tradition.
- 484 English Literature of the 16th Century 3** Course Prerequisite: ENGLISH 302. Advanced study of English Renaissance literature, including More, Sidney, Spenser, Marlowe, and Shakespeare, in age of Humanism and Reformation. Credit not granted for both ENGLISH 484 and ENGLISH 584.
- 485 Milton and English Literature of the 17th Century 3** Course Prerequisite: ENGLISH 302. Advanced study of works from the *Metaphysicals* and Johnson through Milton, in the context of religious controversy and civil war.
- 486 English Literature of the Restoration and 18th Century 3** Course Prerequisite: ENGLISH 302. Advanced study of works from this revolutionary period, including Locke, Behn, Defoe, Pope, Johnson, Equiano, and others.
- 487 British Romantic Literature 3** Course Prerequisite: ENGLISH 302. Advanced study of Blake, Wordsworth, Coleridge, Mary Shelley, Keats, and others in an age of social and aesthetic revolution, 1770-1840.
- 488 Victorian Literature 3** Course Prerequisite: ENGLISH 302. Advanced study of Tennyson, Dickens, Eliot, Wilde, and others in the context of science, industrialization, and empire, 1832-1901.
- 489 [DIVR] 20th/21st Century British and Postcolonial Literatures 3** Course Prerequisite: ENGLISH 302. Advanced study of modernist, postmodernist, and postcolonial writing from Britain, Ireland, Africa, the Indian subcontinent, and the Caribbean.
- 492 [M] Advanced Topics in Literature, Criticism, and Theory 3** May be repeated for credit; cumulative maximum 6 hours. Seminar with term paper project; focused studies in literature and critical theory. Not open to graduate students.
- 494 [CAPS] [M] Advanced Topics in Literature 3** May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Certified major in English; junior standing. Seminar with term paper project; focused studies in American, British, or global literatures. Not open to graduate students.
- 495 Rhetoric of Science and Technology 3** Written, visual, and verbal conventions of scientific disciplines for academic, scientific, technical, and public audiences.
- 498 Internship V 1-15** May be repeated for credit; cumulative maximum 15 hours. Course Prerequisite: Certified major in English; junior standing. Cooperative learning experience in business, education, or industry in English-related jobs. S, F grading.
- 499 Special Problems V 1-4** May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 501 Seminar in the Teaching of Writing: Methodology of Composition 3** Development of a workable definition of the methods of composing through a review of relevant research and problem-solving exercises.
- 502 Seminar in the Teaching of Writing: Contemporary Theories 3** Course Prerequisite: ENGLISH 501. Contemporary theories of composition and their application to the classroom.
- 506 Seminar in 16th Century English Literature 3** May be repeated for credit; cumulative maximum 6 hours.
- 507 Shakespeare 3** Plays, poems, criticism, and background materials.
- 508 Seminar in Assessment of Writing 3** Problems involved in the diagnosis and assessment of student writing.
- 509 Seminar in Classical Rhetoric and its Influences 3** Study of GREEK and Roman rhetorical theories and their influences.
- 510 Backgrounds of American Literature 3** Studies of American writing in cultural contexts.
- 511 Seminar in 17th and 18th Century American Literature 3**
- 512 Introduction to Graduate Study 3**
- 514 Seminar in 20th Century American Literature 3** May be repeated for credit; cumulative maximum 6 hours.
- 515 Contemporary Theories of Rhetoric 3** Contemporary critical theory and cultural studies and reconsiderations of suasive discursive practices.
- 521 Seminar in British Romantic Literature 3** May be repeated for credit; cumulative maximum 6 hours.
- 522 Seminar in Victorian Literature 3** May be repeated for credit; cumulative maximum 6 hours.
- 525 Seminar in English Literature of the 17th Century 3** May be repeated for credit; cumulative maximum 6 hours.
- 527 Seminar in English Literature of the Restoration and 18th Century 3** May be repeated for credit; cumulative maximum 6 hours.

- 529 Seminar in 19th Century American Literature** 3 May be repeated for credit; cumulative maximum 6 hours.
- 531 Administering a Writing Program** 3 Combining theory and practice in writing program supervision and management. Interns will work under direct faculty supervision.
- 532 Teaching Writing to Nontraditional Students** 3 Course Prerequisite: ENGLISH 501. Theory and practice of the teaching of basic writers.
- 534 Theories and Methods of the Teaching of Technical and Professional Writing** 3 Historical and theoretical bases for production of scientific discourse; training in its practical applications.
- 543 Phonology** 3 Technical introductions to the analysis of the sound systems of human languages. Credit not granted for both ENGLISH 443 and 543. Cooperative: Open to UI degree-seeking students.
- 544 Syntax** 3 Technical introduction to the generative analysis of sentence structure with a focus on English. Credit not granted for both ENGLISH 444 and 544.
- 546 Topics in Teaching English as a Second Language** 3 May be repeated for credit; cumulative maximum 6 hours. Topics and controversies related to second language acquisition theory and pedagogy. Cooperative: Open to UI degree-seeking students.
- 548 Seminar in Critical and Cultural Theory** 3 May be repeated for credit; cumulative maximum 6 hours. Critical and cultural theory relevant to advanced literary studies and /or the advanced study of rhetoric and composition.
- 549 Seminar in 20th Century British Literature** 3 May be repeated for credit; cumulative maximum 6 hours.
- 550 Seminar in Poetry or Non-fiction Prose** 3 May be repeated for credit; cumulative maximum 6 hours. Historical and generic studies in poetry and non-fiction prose.
- 554 History of the English Language** 3 Language related to the origin, history, and literature of its speakers. Credit not granted for both ENGLISH 454 and ENGLISH 554.
- 560 Critical Theories, Methods, and Practice in Digital Humanities** 3 History, theory, and practice of digital humanities, with attention paid to how digital humanities are transforming disciplinary knowledge. (Crosslisted course offered as ENGLISH 560, DTC 560).
- 561 Studies in Technology and Culture** 3 Foundation examination of key concepts, tools, and possibilities afforded by engaging with technology through a critical cultural lens. (Crosslisted course offered as DTC 561, ENGLISH 561).
- 567 Seminar in Prose Fiction** 3 May be repeated for credit; cumulative maximum 6 hours. Historical and generic studies of prose fiction.
- 573 Seminar in American Literature** 3 May be repeated for credit; cumulative maximum 12 hours. Major topics and figures.
- 580 Seminar in Medieval Literature** 3 May be repeated for credit; cumulative maximum 6 hours. The literature of western Europe from 450 to 1500.
- 584 English Literature of the 16th Century** 3 Advanced study of English Renaissance literature, including More, Sidney, Spenser, Marlowe, and Shakespeare, in age of Humanism and Reformation. Credit not granted for both ENGLISH 484 and ENGLISH 584.
- 590 Research in English Studies** 1 May be repeated for credit; cumulative maximum 6 hours. Directed reading and interpretive problems in English studies.
- 591 Topics in Pedagogy** 3 Theory and practice of designing and teaching courses in literature, rhetoric, composition, theory, or cultural studies.
- 595 Topics in English** 3 May be repeated for credit; cumulative maximum 6 hours. Language, English pedagogy, or literature of special or current interest; reading theories, teaching of writing, current literary theories.
- 597 Topics in Composition and Rhetoric** 3 May be repeated for credit; cumulative maximum 6 hours. Rhetoric and composition theory and praxis.
- 598 Teaching Apprenticeship** 1 May be repeated for credit. S, F grading.
- 600 Special Projects or Independent Study** V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination** V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 702 Master's Special Problems, Directed Study, and/or Examination** V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.
- 800 Doctoral Research, Dissertation, and/or Examination** V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the English PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Department of Entomology

entomology.wsu.edu
FSHN 166
509-335-5422

Professor and Chair, W. S. Sheppard; Professors, E. H. Beers, C. A. Black, A. Felsot, V. Jones, L. S. Lavine, W. E. Snyder, J. D. Stark, D. B. Walsh, R. S. Zack; Associate Professors, C. Daniels, V. Hebert, D. G. James, J. Owen; Assistant Professors, D. W. Crowder, P. D. Nabity; Professors Emeriti, A. A. Berryman, J. J. Brown, J. F. Brunner, G. E. Long, G. L. Piper, L. K. Tanigoshi, W. J. Turner.

Insects and related arthropods are dominant components in all terrestrial and most freshwater ecosystems. There are more species of insects than all the other species of animals and plants combined. This almost unimaginable diversity provides the most fertile resource for scientific inquiry within a number of areas of biology. Entomology at Washington State University is active, robust, and dynamic. The curriculum provides the opportunity to investigate the basic and applied aspects of the science. Facilities and training are available for study in major areas of entomology including, but not limited to, apiculture, behavior, integrated biological control and sustainable pest management, ecology, insect/plant interactions, population genetics, physiology, taxonomy/systematics, biological diversity, environmental toxicology, and medical/veterinary entomology. We believe that a detailed understanding of insect biology is a prerequisite to developing rational, effective, and sustainable management practices.

The entomology curriculum provides the opportunity to study basic and applied aspects of entomology and prepares students employment in all aspects and levels of the science. Courses provide needed training for students in agriculture, education, veterinary medicine, microbiology, public health, environmental sciences, and natural sciences.

Facilities are available for graduate study in the major areas of entomology as delineated above. Departmental faculty, adjunct faculty, and affiliate faculty may all serve as student advisors. Faculty are housed both on campus and at research stations throughout the state; this ability to significantly interact with both on and off campus advisors and mentors offers students opportunities and perspectives not available in most programs. We maintain strong cooperative interactions with the USDA, ARS and students are encouraged to explore this avenue for advisors and funding opportunities. The department has a long and excellent record of student placement both nationally and internationally. Extensive insect collections, insectary, quarantine, computer, and molecular facilities support teaching, extension, and research. The department is committed to both basic and applied aspects of the science. We are heavily involved in developing an integrated biological control approach to pest management. This commitment is reflected in the broad involvement of the faculty in all aspects of entomology.

The department offers courses of study leading to the degrees of Bachelor of Science in Biology with an Entomology option <http://www.catalog.wsu.edu/General/Academics/Info/10>; Master of

Science in Entomology, and Doctor of Philosophy (Entomology). Additional information can be obtained on the web at <http://entomology.wsu.edu>.

Preparation for Graduate Study

As preparation for work toward an advanced degree in entomology, a student should have completed an undergraduate major in one of the biological or physical sciences, forestry, agriculture, or a closely related field. Potential students with majors in other disciplines are considered on an individual basis. Background work should include courses in the biological and physical sciences, genetics, ecology, entomology, and the plant and animal sciences.

INTEGRATED PEST MANAGEMENT

Integrated pest management is a multidisciplinary field. The Agriculture and Food Security major prepares students to manage plant pests and diseases. Students learn to understand the complexity of relationships within agricultural ecosystems, how external factors influence these systems, and how to effectively manage pests and diseases without incurring undue risks to human or environmental health. The major is offered under Agricultural and Food Systems, <http://www.afs.wsu.edu/>.

Students electing this major will take courses in the Departments of Crop and Soil Sciences, Entomology, Horticulture, and Plant Pathology. Students acquire a holistic perspective and ecological understanding of the philosophy, principles, and practices of pest management and are trained to become professional crop protection specialists.

Student Learning Outcomes

(for the Master's of Science and Doctor of Entomology Degrees)

The Department of Entomology offers graduate programs leading to Doctoral and Master of Science degrees. Upon completion of a Degree Program in Entomology, it is expected that graduates will be have:

- Knowledge of Entomology and its Application
- Exercise Critical and Creative Thinking
- Perform Statistical Analyses and Research Methods.

They will be able to begin and complete a research program by using the knowledge they have accrued by active field research. The curriculum provides the opportunity to study the basic and applied aspects of the science. Facilities and training are available for graduate study in major areas of entomology, including (but not limited to) apiculture; behavior; integrated biological control and sustainable pest management; ecology; forest entomology; insect/plant interactions; medical/veterinary entomology; population genetics; physiology; systematic; biological diversity and environmental toxicology. Departmental faculty, adjunct faculty, and affiliate faculty may all serve as student advisors. Faculty are housed both on campus and at Research and Extension Centers throughout the state; the ability to significantly interact with both on- and off-campus advisors and mentors offers students opportunities and perspectives not available in most programs. We maintain strong cooperative interactions with the USDA ARS lab in Yakima, Washington. Students whose major advisor resides at a Research and Extension Center (Wenatchee, Prosser, Puyallup, Mt. Vernon or USDA Wapato) typically come to

Pullman for at least two semesters then relocate to the center where they will conduct their research and take the remainder of their coursework via AMS/WEEN. Each student's program of study is individualized based on their research interests, prior academic experience, and collaboration with their major advisor.

Minors

Entomology

A minimum of 16 hours is required for the minor and must include ENTOM 343, 344, 439, or 440 and 9 hours from: ENTOM 348, 441, 448, 449, 450, 462; IPM 201, 452, 462. 9 hours of upper-division work must be taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Description of Courses

ENTOMOLOGY

ENTOM

101 [BSCI] Insects and People: A Perspective 3 The world's most abundant animals and their extensive effects on people yesterday and today.

102 [BSCI] Insects, Infection and Illness: Medical Entomology for Non-Science Majors 4 (3-3) Multidisciplinary aspects of infectious disease caused by insect transmission of pathogens.

103 [BSCI] Discover Insects: Laboratory for Non-Science Majors 1 (0-3) The biology and diversity of insects provide the context for training in the scientific method, including ways to take measurements, gather data, and organize information.

150 [BSCI] Insects, Science, and World Cultures 3 (2-3) An interdisciplinary view of the global impact of insects on humans in the arts, myths and legends, cuisine, human nutrition, agriculture, sustainability, and medicine; exploration of the use of insects and their products in culture, scientific research, and forensics. Cooperative: Open to UI degree-seeking students.

201 [BSCI] Science in the Public Eye 3 Course Prerequisite: [PSCI] UCORE or concurrent enrollment, [SCI] UCORE or concurrent enrollment, or sophomore standing. Scientific literacy in biology and medicine, using evolutionary theory as the unifying framework for all life.

340 Agricultural Entomology 3 (2-3) Course Prerequisite: BIOLOGY 106 or 107. Control, identification, and biology of insects and related arthropods. Course equivalent to OSU's Ent 311 and UI's Ent 322.

343 [M] General Entomology 3 Biology, natural history, and importance of insects and related arthropods.

344 [M] General Entomology Laboratory 2 (0-6) Identification and taxonomy of insects and related arthropods; insect collection and field work required.

351 Ecological and Integrated Pest Management 3 Course Prerequisite: BIOLOGY 106, 107, or 120. Philosophy, ecological foundation, tactics, and strategies of ecologically-based and integrated pest management.

361 Honey Bee Biology 3 Biology of the honey bee, including behavior, genetics, evolution, pollination, sociality, and beekeeping practices.

401 Biology and Society, Past and Present 3 Course Prerequisite: BIOLOGY 106. Development of biological ideas and knowledge from antiquity to present with emphasis on major advances achieved through invertebrate models. Recommended preparation: BIOLOGY 150. Cooperative: Open to UI degree-seeking students.

448 Medical and Veterinary Entomology 3 Biology and ecology of parasitic arthropods and their direct impacts on human and animal health; transmission of pathogens. Credit not granted for both ENTOM 448 and ENTOM 548.

460 Biotechnology and the Environment 3 Course Prerequisite: BIOLOGY 106, 107, or 120; 3 credit hours CHEM. Benefits, regulations, and human and environmental impacts of biotechnology used for crop protection, agricultural and energy production, and environmental remediation and management. (Crosslisted course offered as ENTOM 460, ENVR SCI 460).

490 Special Topics in Entomology V 1-4 May be repeated for credit; cumulative maximum 10 hours. Credit not granted for both ENTOM 490 and ENTOM 590. Cooperative: Open to UI degree-seeking students.

539 Taxonomic Entomology 4 (2-6) Survey of approximately 200 major families; collecting and preservation techniques. Cooperative: Open to UI degree-seeking students.

540 Taxonomy of Immature Insects V 2-4 Identification of eggs, larvae, nymphs, and pupal stages of insects. Insect collection required.

548 Medical and Veterinary Entomology 3 Biology and ecology of parasitic arthropods and their direct impacts on human and animal health; transmission of pathogens. Credit not granted for both ENTOM 448 and ENTOM 548.

550 Insect Physiology 3 General principles of insect physiology; the mechanisms of vital processes in insects; organ, cellular, subcellular, chemical and physical levels. Required preparation must include BIOLOGY 332, 352, CHEM 345, ENTOM 340, or 343. Cooperative: Open to UI degree-seeking students.

555 Agricultural Chemical Technology for Crop Protection & Production 3 Mechanistic examination of agricultural chemical technology; synthetic and biological pesticides and fertilizers; mechanism of biological activity; deployment; management.

556 Insecticides: Toxicology and Mode of Action 1 Insecticides in terms of historical perspective, classification, synthesis, toxicity, mode of action, and metabolism. Required preparation must include MBIOS 303; CHEM 345; BIOLOGY 352, 420, or 350.

557 Herbicides: Toxicology and Mode of Action 1 Herbicides in terms of historical perspective, classification, synthesis, toxicity, mode of action, and metabolism. Required preparation must include MBIOS 303; CHEM 345; BIOLOGY 352, 420, or 350.

558 Pesticide Topics 1 Current issues concerning pesticides in terms of toxicity, mode of action, and metabolism. Required preparation must include MBIOS 303; CHEM 345; BIOLOGY 352, 420, or 350.

590 Special Topics in Entomology V 1-4 May be repeated for credit; cumulative maximum 10 hours. Credit not granted for both ENTOM 490 and ENTOM 590. Cooperative: Open to UI degree-seeking students.

593 Seminar 1 May be repeated for credit. Reporting and discussing problems and research in entomology.

700 Master's Research, Thesis, and/or Examination V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

702 Master's Special Problems, Directed Study, and/or Examination V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, F grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Entomology PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

INTEGRATED PEST MANAGEMENT

IPM

201 Introduction to Pest Management in a Quality Environment 2 Pest management to maximize plant protection and safeguard the quality of the environment.

399 Pest Management Internship V 1-4 May be repeated for credit; cumulative maximum 7 hours. Supervised individual practicum with IPM-oriented businesses, organizations, and governmental agencies; professionally related field interaction. S, F grading.

452 Pesticides and the Environment 3 Immediate and prolonged effects of pesticides on human and other animals; legal and moral repercussions of pesticide use. Credit not granted for both IPM 452 and 552. Recommended for graduate-level course: 12 credit hours of biology or ecology courses.

552 Pesticides and the Environment 3 Immediate and prolonged effects of pesticides on human and other animals; legal and moral repercussions of pesticide use. Credit not granted for both IPM 452 and 552. Recommended for graduate-level course: 12 credit hours of biology or ecology courses.

School of the Environment

environment.wsu.edu

Webster Physical Science Bldg, 1228

509-335-3009

Student Svs: Webster 1227, 509-335-8538

Interim Director and Professor, L. Hufford; Associate Director for Undergraduate Education and Clinical Assistant Professor, A. B. King; Associate Director for Research and Graduate Studies and Associate Professor, M. Swanson; Professors, K. A. Blatner, S. M. Bollens, M. S. Carroll, D. R. Gaylord, S. Hampton, C. K. Keller, P. B. Larson, C. T. Robbins, D. Schulze-Makuch, L. A. Shipley, J. Vervoort, J. A. Wolff; Associate Professors, C. M. Cooper, A. K. Fremier, L. H. Hardesty, J. Harrison, S. Henderson, S. L. Katz, S. P. Long, B.C. Moore, M. Ostrom, R. D. Saylor, R. B. Wielgus, B. A. Zamora; Assistant Professors, C. S. Goldberg, M. Kramer, D. H. Thornton; Clinical Professor, G. Rollwagen-Bollens; Clinical Assistant Professor, M. Berger; Assistant Research Professors, O. Neill, C. Timchalk, Z. Shi; Senior Instructor: K. Wilkie; Adjunct Faculty, H. Brenkert-Smith, J. Chappell, R. Cook, R. Everett, R. Gooete, B. Green, C. Grue, D.G. Horton, E. Laija, R. Long, B. T. Maletzke, J. Manning, T. Paveglio, P. L. Pavek, J. L. Rachlow, S. Reidel, J. Rosso, M. A. Schroeder, S. Self, E. W. Shallenberger, P. Stansbury, D. Strom, R. Swenson, B. Tissot, T. N. Tollefson; Affiliate Faculty, J. Bishop, A. Boyd, M. Brady, C. Bustamante, L. Carpenter-Boggs, A. Felsot, J. Freed, J. Garcia-Pabon, T. Hudson, P. Jacoby, C. Mack, T. Norton, A. Perleberg, R. Rupp, C. Shultz, J. Stark, N. Strigul, S. Sylvester, P. Thiers, K. Zobrist; Professors Emeriti, D. M. Baumgartner, W. Budd, R. C. Chapman, F. F. Foit, A. Ford, D. P. Hanley, G. W. Himman, P. E. Rosenberg, R. L. Shew, A. Watkinson, G. D. Webster, G. I. Young.

Humans are rapidly altering planetary biogeochemical processes and earth systems without fully knowing the consequences. Environmental challenges include food, water, and energy shortages, changing climate and weather patterns, rising and acidifying oceans, depleted soil and forest resources, and endangerment of a third or more of all the natural biological diversity of life on Earth. In response, society is shifting priorities to address these issues and students are looking for degrees that provide interdisciplinary training to tackle these emerging problems. Never before has there been such urgent need to address complex, multidimensional environmental and social problems.

The WSU School of the Environment strives to

create synergy by marrying research, teaching, and extension efforts to ensure an ecologically sound, socially responsible, and economically viable future for communities in Washington. The School integrates the geosciences (the physical context for global change), ecosystem and natural resource sciences (the biological context), and social/sustainability sciences (the human context). School faculty are located throughout WSU – in Pullman, Tri-Cities, Vancouver, and the WSU research and extension centers.

Faculty and students in the School are:

- Generating fundamental knowledge about the Earth, environmental and ecological processes, natural resources, and human-environment interactions.
- Developing solutions to state, national, and global environmental problems (e.g., sustainable use of water, forests, wildlife, and other natural resources).
- Providing cutting-edge interdisciplinary undergraduate and graduate training to the next generation of research scientists, environmental and natural resource managers, environmental leaders, policy makers, and global citizens.
- Facilitating the integrated research and education necessary to support the Land Grant mission to achieve a sustainable future.
- Promoting the long-term conservation and enhancement of biological diversity and natural resources in an ecologically sustainable manner.

The WSU School of the Environment has defined several core themes to better address new and emerging challenges in the study of earth, environment, and ecology. These include:

- "Water: Connecting Earth and Life," current strengths in eco-hydrology: modeling land and water interactions, biophysical, chemical and ecological dynamics in freshwater ecosystems and water resources in the Columbia River Basin.
- "Global Change: Sustaining Healthy Landscapes and Communities," existing strengths in landscape and spatial ecology, wildlife ecology and conservation of biodiversity, restoring ecosystems, and environmental social science.
- "Dynamic Earth," Earth system science, with existing strengths in earth system chemistry, planetary evolution and deep time, and geologic and environmental hazards.

Specific information below describes courses and majors under the Bachelor of Science in Earth and Environmental Sciences.

BS in EARTH AND ENVIRONMENTAL SCIENCES

The School of the Environment offers a BS in Earth and Environmental Sciences with majors in: Earth Sciences, Environmental and Ecosystem Sciences, Forestry, and Wildlife Ecology and Conservation Sciences. Additional information about the School can be found at: <http://environment.wsu.edu/>.

Student Learning Outcomes

Graduates of the School of the Environment are concerned with the diverse environmental challenges confronting the future of all life on Earth. Students learn to communicate and use critical thinking and creative problem solving to address pressing issues confronting global ecology and sustainability on a dynamic and changing Earth. Students apply scientific methods, quantitative and

symbolic reasoning, and decision-making processes as individuals or teams to explore complex scientific and environmental issues and analyze problems in both the natural and social sciences. We emphasize realistic experiential education (e.g., hands-on labs, field trips and camps) to prepare students for graduate studies or employment in the fields of natural resources, environmental science or earth sciences. Graduates achieve expertise in a professional specialty and develop the technical skills and a deeper understanding of the science and environmental management needed to succeed in a global society increasingly dependent on developing a sustainable future.

Web Link: <http://environment.wsu.edu/outcomes/>

Earth Sciences Major

Earth Science is the study of the Earth, its composition, processes, structure, origin and evolution. Virtually every aspect of modern life is in some way dependent on the science of geology. The geologic record provides the context for understanding episodes of past rapid global change. It is also the geologist's job to evaluate groundwater quality and quantity for drinking water supply, discover new reserves of energy and raw materials, assess geologic hazards in land-use planning and unravel the mechanisms of volcanism, earthquakes, plate tectonics and the origins of life.

In addition to the University Common Requirements (UCORE), basic science courses and the School of the Environment common core, students majoring earth sciences complete a series of 300-400-level courses designed to provide training for professional geological work as well as preparation for postgraduate study.

The School of the Environment has well-equipped geological laboratory facilities, including electron microprobe, X-ray diffraction and fluorescence instruments, a laser ablation cell and 6 mass spectrometers for the determination of trace elements, isotope ratios, and organic compounds. There are active research programs in volcanology, geochemistry, tectonics, groundwater and contaminant hydrology, sedimentology, stratigraphy, and astrobiology.

Earth Sciences majors are expected to graduate with a complete understanding of earth, including its constituent materials, environments, and processes through which these materials form and interact, and its physical, chemical, and biological evolution. Students are expected to be capable of examining and interpreting relations among geologic materials in the field. Problem solving and critical thinking will be applied in the classroom, laboratory, and field, and effective communication skills will be expected. Students will demonstrate quantitative understanding of earth materials and processes.

The Geology Club is open to all students interested in geology and allied sciences. It provides additional opportunities for our students to learn about local and regional geology. Weekend field and mineral collecting trips take advantage of the very diverse geology of the inland northwest region, and provides other out-of-class opportunities for students to informally interact with each other, faculty and professionals outside of WSU.

As preparation for work toward an advanced degree in geology, a student should have completed, or

plan to take without graduate credit, the following or their equivalents: GEOLOGY 102, 210, 308, 320, 340, 350, 351, 356; one year of general physics; one year of general inorganic chemistry; mathematics through two semesters of calculus. A minimum GPA of 3.0 is normally required for admission.

Environmental and Ecosystem Sciences Major

The Environmental and Ecosystem Sciences major is offered for students interested in biological, physical, or socioeconomic aspects of environmental and natural sciences. This is the most flexible of our majors, offering exceptional opportunities for tailoring of courses to match individual student interests and needs within the realm of environmental and ecosystem sciences.

Environmental and Ecosystem Sciences is concerned with natural and managed environments and their interactions with biological and human systems. Emphasis is put on the comprehensive understanding of environmental and ecological contexts, assessment of beneficial and disruptive anthropogenic impacts, and methodologies to analyze and resolve conflict in complex systems. Students acquire interdisciplinary perspectives and understanding necessary to prepare them for a variety of roles in the study, planning and management of the environment.

All students in Environmental and Ecosystem Sciences major will receive a well-rounded, general science background in the physical and life sciences. They will develop an in-depth, interdisciplinary expertise in an area of concentration within the field. In addition to the University Common Requirements (UCORE), basic science courses and a common core taken by all students completing a BS in Earth and Environmental Sciences, students select a structured set of courses in concert with their advisor based upon their area(s) of primary interest. Lists of approved electives are available from an advisor.

The School of the Environment has well-equipped laboratory facilities for physical, chemical, and biological assessment of aquatic ecosystems (streams and lakes), modeling environmental processes, and evaluating impacts of human activities. There are active research programs examining effects of invasive species, ecosystem restoration, and many aspects of water resource management.

The Environmental Science Club provides opportunities for students with common interests to share ideas and discuss relevant topics concerning environmental issues. The club contributes to sustainability programs at WSU and helps promote environmentally conscious activities on and around the WSU campus. In addition, it provides out of class opportunities for students to interact with faculty and other professionals. These interactions create opportunities for networking that helps students find summer and permanent employment as well as internship opportunities in their chosen field.

Forestry Major

The Forestry Major is designed to provide students the educational basis for successfully pursuing a professional career in forestry. Each forestry student, in addition to completing the university UCORE requirements, basic science requirements, the School of the Environment environmental common core takes a block of forestry classes in

such areas as forest measurements, sampling, remote sensing, geographic information systems, plant ecology and silviculture. In addition, students completing the basic requirements of this degree also have the option to select a limited number of professional electives to further focus their basic skill set. For example, by selecting the correct courses students may easily complete a minor in geospatial analysis. Students completing this degree also meet the qualifications required in U.S. Office of Personnel Management for forester.

The student chapter of the Society of American Foresters (Forestry Club) provides out of class opportunities for students to interact with each other socially and professionally, with the faculty and other professionals in the region. Students regularly work on forestry related projects for landowners in the area under the supervision of faculty members, gaining practical field experience and further insights into the profession. These experiences are often helpful in obtaining summer jobs, internships and professional employment upon graduation.

Wildlife Ecology and Conservation Major

The Wildlife Ecology and Conservation major provides students with a basic background in the sciences plus additional courses emphasizing wildlife ecology and management of wildlife habitats and populations. Students are prepared to pursue a variety of careers focusing on wildlife biology and wildlife management. The core requirements plus approved wildlife electives may allow majors to meet the US Office of Personnel Management requirements for wildlife biologist, wildlife refuge manager, general biologist, and zoologist. Through judicious use of electives a student can also meet additional civil service requirements for fish biologist and range conservationist. Wildlife students can further individualize and often enhance their professional credentials by minoring in another subject such as criminal justice, geospatial analysis, or forestry.

In addition to the University Common Requirements (UCORE), basic science courses and the School of the Environment common core, students in this major complete a core of wildlife classes emphasizing wildlife ecology, management, nutrition, population ecology, and conservation biology. Opportunities for specialization and pursuit of individual student interests beyond the wildlife core are provided through approved electives in the areas of habitat ecology, aquatic ecology, animal ecology, and conservation biology. Students seeking to complete the key science prerequisites for admission to the College of Veterinary Medicine may do so as a part of this major through the pre-vet option.

The student chapter of The Wildlife Society provides out of class opportunities for students including lectures, field trips, hands-on learning while interacting with socially and professionally with each other, faculty and other professionals. These types of contacts along together with employing organizations and interaction with career services on campus help students obtain summer and permanent employment, as well as internship and cooperative education opportunities in their chosen field.

Teaching and research facilities and laboratories on campus provide students with knowledge and training in wildlife ecology and conservation, including Bear Research Education and Conservation

Program, Wild Ungulate and Small Mammal Research Facility, Large Carnivore Conservation Lab, Endangered Species Lab, Conservation Genetics and Environmental DNA Lab, Geographic Information System Lab, and the E.H. Steffen Center. These facilities and nearby natural forest, rangeland and aquatic ecosystems provide opportunities for field and experiential learning.

Pre-Veterinary Medicine

Students seeking to complete the key science prerequisites for admission to the College of Veterinary Medicine may do so through the proper selection of basic science courses and through the use of their electives within the Wildlife Ecology and Conservation Sciences.

Minors

The School of the Environment offers minors in: Earth Science, Environmental Science, Forestry, Natural Resources, Rangeland Ecology and Management, and Wildlife Ecology. Please contact one our offices for more information.

Transfer Students

Transfer students should plan to complete the basic required courses in English composition, chemistry, speech, biological sciences, mathematics, microeconomics, social sciences, and arts and humanities by the end of their sophomore year. Students may be granted credit for equivalent technical courses taken at other academic institutions. Refer to WSU Transfer Guides for Community Colleges, available through the web, for details.

Graduate Programs

Graduate programs provide students with an increased depth of knowledge of the scientific basis of their profession and a more complete understanding of the holistic nature of global change science.

The School of the Environment offers thesis-based MS degrees in:

- Environmental Sciences
- Geology
- Natural Resource Sciences

PhD degrees are offered in:

- Environmental and Natural Resource Sciences
- Geology

For each graduate degree, students may specialize in a variety of biological, geochemical, physical or social science aspects of Earth, environmental or natural resource science through advanced coursework and graduate research. Graduate course requirements are flexible, and students with degrees in related fields are encouraged to apply. To be accepted to graduate study, applicants must (1) meet the Graduate School's minimum admission requirements, (2) complete the department's supplemental application form, (3) submit Graduate Record Exam (GRE) scores and (4) have at least one member of the department's faculty willing to serve as the student's major advisor. (Note: the School of the Environment does not have a minimum required GRE score for admission.) Students interested in graduate study should consult the WSU Graduate Bulletin and contact the School of the Environment for further information on opportunities and requirements.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

EARTH SCIENCES (120 HOURS)

First Year

<i>First Term</i>	<i>Hours</i>
CHEM 101 [PSCI] or 105 [PSCI]	4
GEOLOGY 101 or 102	4
HISTORY 105 [ROOT]	3
MATH 106 or electives ¹	3

<i>Second Term</i>	<i>Hours</i>
CHEM 102 or 106	4
ECONS 101 [SSCI]	3
ENGLISH 101 [WRTG]	3
GEOLOGY 210	4
MATH 108 or electives ¹	2

Second Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI]	4
ENVR SCI 101	4
GEOLOGY 350	4
PHYSICS 101 or 201	4

<i>Second Term</i>	<i>Hours</i>
GEOLOGY 315	3
Humanities [HUM]	3
MATH 140 [QUAN] or 171 [QUAN]	4
PHYSICS 102 or 202	4
Complete Writing Portfolio	4

<i>Third Term</i>	<i>Hours</i>
Summer Session: GEOLOGY 307 ²	3

Third Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
GEOLOGY 320	3
SOIL SCI 368 or ENVR SCI 310	3
STAT 412	3

<i>Second Term</i>	<i>Hours</i>
COM 102 [COMM] or H D 205 [COMM]	3 or 4
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
GEOLOGY 340 [M]	4
GEOLOGY 356	4

<i>Third Term</i>	<i>Hours</i>
Summer Session: GEOLOGY 408 [CAPS] [M]	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
ENGLISH 301 or 402 [M]	3
NATRS 300 or BIOLOGY 372	3 or 4
Professional Electives ³	6
Foreign Language, if necessary, or Elective ⁴	3 or 4

<i>Second Term</i>	<i>Hours</i>
GEOLOGY 303	3
NATRS 312 [DIVR] ⁵	3
Professional Electives ³	4
Foreign Language, if necessary, or Elective ⁴	3 or 4

¹ MATH 106 and 108 are required courses. However, if students have tested into or taken MATH 140, 171, 172 or ALEKS with a 70% or better, MATH 106 and 108 will be waived.

² GEOLOGY 307 is the approved Experiential Elective for Earth Science majors.

³ Within the School of the Environment, professional electives are courses selected by the student in concert with their advisor that pertain to their major and/or to a specific sub-discipline of interest. Professional electives may also include courses from outside of their major as needed to complete a minor in another field of study. Approved courses include but are not limited to any 300-400-level CHEM, GEOLOGY, or SOIL SCI course.

⁴ Two years of high school foreign language or at least two semesters of college-level foreign language are required by the College of Arts and Sciences for graduation.

⁵ Alternative to NATRS 312 is ENVR SCI 444. Students choosing ENVR SCI 444 will need to take a [DIVR] course as an elective to fulfill University requirements.

ENVIRONMENTAL AND ECOSYSTEM SCIENCES (120 HOURS)

First Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106	4
ENVR_SCI 101 [BSCI]	4
HISTORY 105 [ROOT]	3
MATH 106 or electives ¹	3
Foreign Language, if necessary ²	0 - 4

<i>Second Term</i>	<i>Hours</i>
CHEM 101 [PSCI] or 105 [PSCI]	4
COM 102 [COMM] or H D 205 [COMM]	3
ENGLISH 101 [WRTG]	3
Humanities [HUM]	3
MATH 108 or electives ¹	2

Second Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 107	4
ECONS 101 [SSCI]	3
PHYSICS 101 or GEOLOGY 101	4
200-level Required Electives ³	2 or 3
Foreign Language, if necessary ²	0 - 4

<i>Second Term</i>	<i>Hours</i>
CHEM 102 or 106	4
Creative & Professional Arts [ARTS]	3
NATRS 300 ⁴	3
STAT 212 [QUAN], MATH 140 [QUAN], or 171 [QUAN]	4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
Modeling and Spatial Analysis Requirement ⁵	3 or 4
STAT 360, 370, or 412 ⁶	3
Water Science Requirement ⁷	3
Professional Electives ⁸	7

<i>Second Term</i>	<i>Hours</i>
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Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
Diversity [DIVR] ⁹	3
Earth Systems Requirement ¹⁰	3
Society and Environmental Management Requirement ¹¹	3 or 4
Professional Electives ⁸	4

Fourth Year

<i>First Term</i>	<i>Hours</i>
Integrative Capstone [CAPS] ¹²	3
Professional Electives ⁸	10
Writing in the Major [M] ¹³	3
<i>Second Term</i>	<i>Hours</i>
ENGLISH 301 or 402	3
Experiential Elective ¹⁴	3
Professional Electives ⁸	7
Writing in the Major [M] ¹³	3
Exit Survey ¹⁵	

¹ MATH 106 and 108 are required courses. However, if students have tested into or taken MATH 140, 171, 172 or ALEKS with a 70% or better, MATH 106 and 108 will be waived.

² Two years of high school foreign language or at least two semesters of college-level foreign language are required by the College of Arts and Sciences for graduation.

³ Approved 200-level required electives by campus include: (Pullman) ENVR SCI, 275, 285, GEOLOGY 230 or NATRS 204; (Tri-Cities) GEOLOGY 230; (Vancouver) ENVR SCI, 250, 275, or GEOLOGY 230.

⁴ Alternative to NATRS 300 is BIOLOGY 372.

⁵ Modeling and Spatial Analysis by campus: (Pullman) BIOLOGY 340, ENVR SCI 310, or SOIL SCI 368; (Tri-Cities) ENVR SCI 310; (Vancouver) BIOLOGY 340 or ENVR SCI 310.

⁶ MATH 172 is a prerequisite for STAT 360 and 370.

⁷ Water Science by campus: (Pullman) GEOLOGY 315 or NATRS 460; (Tri-Cities) GEOLOGY 230 or 475; (Vancouver) BIOLOGY 308 or ENVR SCI 463.

⁸ Professional electives are courses selected by students in concert with their advisor and pertain to their major and/or to a specific sub-discipline of interest. Professional electives may also include courses from outside of their major as needed to complete a minor in another field of study. Approved courses include but are not limited to: ECONS 330, ENVR SCI 275, 285, or any 300-400-level ENVR SCI course, GEOLOGY 210, 230, or any 300-400-level GEOLOGY course, NATRS 204, or any 300-400-level NATRS course, any 300-400-level SOIL SCI course, minors in Sociology, Political Science, Criminal Justice and Geospatial Analysis, or as approved by advisor.

⁹ NATRS 312 satisfies both the DIVR and the Society and Environmental Management requirements.

¹⁰ Earth Systems by campus: (Pullman) GEOLOGY 303; (Tri-Cities) GEOLOGY 390; (Vancouver) ENVR SCI 410.

¹¹ Society and Environmental Management by campus: (Pullman) ENVR SCI 444 or NATRS 312; (Tri-Cities) ENVR SCI 335 or 444; (Vancouver) ENVR SCI 335 or 444.

¹² Approved Integrated Capstone courses include: BIOLOGY 401 (Tri Cities and Pullman), BIOLOGY 408 (Pullman), and (Vancouver) as approved by advisor.

¹³ Writing in the Major by campus: (Pullman) NATRS 411, 446, 450, 454, 464; (Tri-Cities) ENVR SCI 335 and 404; (Vancouver) ENVR SCI 335 and 404.

¹⁴ Certified students in the School of the Environment are required to fulfill the Experiential Requirement before graduation. This requirement is designed to give students experience that they will not receive in the traditional classroom oriented course, and to better prepare them for a successful career after graduation. Approved courses include (Pullman) ENVR SCI 492, 495, NATRS 479; (Tri-Cities) ENVR SCI 492, 495; (Vancouver) ENVR SCI 492, 495; or as approved by advisor. Students can also meet the requirement by documenting at least 135 hours of volunteer or paid work related to their field of study and approved by their advisor. This allows students to obtain relevant experience without the constraints of a course taught during a particular semester.

¹⁵ Students must complete a School of the Environment exit survey, administered during the final semester.

FORESTRY (120 HOURS)

First Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI]	4
ECONS 101 [SSCI]	3
HISTORY 105 [ROOT]	3
Humanities [HUM]	3
MATH 106 or Elective ¹	3

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 107	4
CHEM 101 [PSCI] or 105 [PSCI]	4
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3
MATH 108 or Elective ¹	2

Second Year

<i>First Term</i>	<i>Hours</i>
COM 102 [COMM] or H D 205 [COMM]	3 or 4
ECONS 330	3
NATRS 204	2
NATRS 300	3
NATRS 301	3

<i>Second Term</i>	<i>Hours</i>
NATRS 302	3
NATRS 305	3
NATRS 312 [DIVR]	3
SOIL SCI 374	3
STAT 212 [QUAN] or MATH 140 [QUAN]	4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
GEOLOGY 210 [M]	4
NATRS 304	4
SOIL SCI 201	3
SOIL SCI 368	3

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
ENGLISH 301 [M] or 402 [M]	3
NATRS 404	3
NATRS 438	3
NATRS 460	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
NATRS 430	3
NATRS 455	3
STAT 412	3
Experiential Elective ²	3
Professional Electives ³	4

<i>Second Term</i>	<i>Hours</i>
NATRS 446 [M] or 450 [M]	3
NATRS 454 [CAPS]	3
NATRS 464	3
NATRS 485	4

¹ MATH 106 and 108 are required courses. However, if students have tested into or taken MATH 140, 171, 172 or ALEKS with a 70% or better, MATH 106 and 108 will be waived.

² Certified students in the School of the Environment are required to fulfill the Experiential Requirement before graduation. This requirement is designed to give students experience that they will not receive in the traditional classroom oriented course, and to better prepare them for a successful career after graduation. Approved courses include ENVR SCI 492, 495, NATRS 479, or as approved by advisor. Students can also meet the requirement by documenting at least 135 hours of volunteer or paid work related to their field of study and approved by their advisor. This allows students to obtain relevant experience without the constraints of a course taught during a particular semester.

³ Forestry Professional Electives: Within the School of the Environment, professional electives are courses selected by the student in concert with their advisor that pertain to their major and/or to a specific sub-discipline of interest. Professional electives may also include courses from outside of their major as needed to complete a minor in another field of study. Approved Professional electives include: NATRS 446 [M] and SOIL SCI 468 or as approved by advisor.

WILDLIFE ECOLOGY AND CONSERVATION SCIENCES - PRE-VETERINARY OPTION (123 HOURS)

First Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI]	4
CHEM 105 [PSCI]	4
COM 102 [COMM] or H D 205 [COMM]	3 or 4
HISTORY 105 [ROOT]	3
MATH 106 ¹	0 - 3

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 107	4
CHEM 106	4
ENGLISH 101 [WRTG]	3
Humanities [HUM]	3
MATH 108 ¹	0 - 2

Second Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
ECONS 101 [SSCI]	3
NATRS 204	2
NATRS 300 ²	3

NATRS 301	3
NATRS 310	4
<i>Second Term</i>	
Creative & Professional Arts [ARTS]	3
ENGLISH 301 [WRTG] or 402 [WRTG] [M]	3
MATH 140 [QUAN], 171 [QUAN], or STAT 212 [QUAN]	4
NATRS 302	3
NATRS 312 [DIVR] ³	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	
Animal Systematics Elective ⁴	3 or 4
CHEM 345	4
NATRS 435	4
SOIL SCI 368 or ENVR SCI 310 [M]	3 or 4
Foreign Language, if needed ⁵	0 - 4
<i>Second Term</i>	
NATRS 431	3
NATRS 438	3
NATRS 460	3
STAT 412	3
Foreign Language, if needed ⁵	0 - 4

Fourth Year

<i>First Term</i>	
BIOLOGY 301	4
Experiential Elective ⁶	3
MBIOS 303	4
NATRS 454 [CAPS]	3
PHYSICS 101	4
<i>Second Term</i>	
Animal Systematics Elective ⁴	4
GEOLOGY 303	3
NATRS 441	4
NATRS 446 [M]	3
NATRS 450 [M]	3
Exit Survey ⁷	

¹ MATH 106 and 108 are required courses. However, if students have tested into or taken MATH 140, 171, 172 or ALEKS with a 70% or better, MATH 106 and 108 will be waived.

² Alternative to NATRS 300 is BIOLOGY 372.

³ Alternative to NATRS 312 is ENVR SCI 444. Students choosing ENVR SCI 444 will need to take a [DIVR] course as an elective to fulfill University requirements.

⁴ Choose two of the following Animal Systematics Courses: BIOLOGY 412, 423, 428, or 432 [M].

⁵ Two years of high school foreign language or at least two semesters of college-level foreign language are required by the College of Arts and Sciences for graduation.

⁶ Certified students in the School of the Environment are required to fulfill the Experiential Requirement before graduation. This requirement is designed to give students experience that they will not receive in the traditional classroom oriented course, and to better prepare them for a successful career after graduation. Approved courses include ENVR SCI 492, 495, NATRS 479, or as approved by advisor. Students can also meet the requirement by documenting at least 135 hours of volunteer or paid work related to their field of study and approved by their advisor. This allows students to obtain relevant experience without the constraints of a course taught during a

particular semester.
⁷ Students must complete a School of the Environment exit survey, administered during the final semester.

WILDLIFE ECOLOGY AND CONSERVATION SCIENCES – BASIC OPTION (120 HOURS)

First Year

<i>First Term</i>	
BIOLOGY 106 [BSCI]	4
ECONS 101 [SSCI]	3
HISTORY 105 [ROOT]	3
Humanities [HUM]	3
MATH 106 or electives ¹	3
<i>Second Term</i>	
BIOLOGY 107	4
CHEM 101 [PSCI] or 105 [PSCI]	4
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3
MATH 108 or electives ¹	2

Second Year

<i>First Term</i>	
COM 102 [COMM] or H D 205 [COMM]	3 or 4
NATRS 204	2
NATRS 300 ²	3
NATRS 301	3
NATRS 310	3
<i>Second Term</i>	
CHEM 102 or 106	4
MATH 140 [QUAN], 171 [QUAN], or STAT 212 [QUAN]	4
NATRS 302	3
NATRS 312 [DIVR] ³	3
Foreign Language, if necessary ⁴	0 - 4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	
Animal Systematics course ⁵	4
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
Professional Electives ⁶	3
SOIL SCI 368 or ENVR SCI 310 [M]	3
Foreign Language, if necessary ⁴	0 - 4
<i>Second Term</i>	
GEOLOGY 303	3
NATRS 431	3
NATRS 450 [M]	3
NATRS 460 or GEOLOGY 315	3
STAT 412	3

Fourth Year

<i>First Term</i>	
ENGLISH 301 or 402 [M]	3
Experiential Elective ⁷	3
NATRS 435	4
NATRS 454 [CAPS]	3
Professional Electives ⁶	2
<i>Second Term</i>	
Animal Systematics Course ⁵	4
NATRS 438	3
NATRS 441	4
NATRS 446 [M]	3

Professional Electives⁶ 3
 Exit Survey⁸

¹ MATH 106 and 108 are required courses. However, if students have tested into or taken MATH 140, 171, 172 or ALEKS with a 70% or better, MATH 106 and 108 will be waived.

² Alternative to NATRS 300 is BIOLOGY 372.

³ Alternative to NATRS 312 is ENVR SCI 444. Students choosing ENVR SCI 444 will need to take a [DIVR] course as an elective to fulfill University requirements.

⁴ Two years of high school foreign language or at least two semesters of college-level foreign language are required by the College of Arts and Sciences for graduation.

⁵ Choose two of the following Animal Systematics Courses: BIOLOGY 412, 423, 428, or 432 [M].

⁶ Within the School of the Environment, professional electives are courses selected by the student in concert with their advisor that pertain to their major and/or to a specific sub-discipline of interest. Professional electives may also include courses from outside of their major as needed to complete a minor in another field of study. Approved courses include but are not limited to: any CRM J course or any 200-400-level ANIM SCI, BIOLOGY, CHEM, ENVR SCI, MBIOS, NATRS or SOIL SCI course.

⁷ Certified students in the School of the Environment are required to fulfill the Experiential Requirement before graduation. This requirement is designed to give students experience that they will not receive in the traditional classroom oriented course, and to better prepare them for a successful career after graduation. Approved courses include ENVR SCI 492, 495, NATRS 479, or as approved by advisor. Students can also meet the requirement by documenting at least 135 hours of volunteer or paid work related to their field of study and approved by their advisor. This allows students to obtain relevant experience without the constraints of a course taught during a particular semester.

⁸ Students must complete a School of the Environment exit survey, administered during the final semester.

Minors

Earth Sciences

An Earth Science minor requires a minimum of 16 semester hours of letter-graded geology coursework or approved electives, 9 hours of which must be in 300-400-level course work taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Environmental Science

A minor in Environmental Science requires a minimum of 16 credit hours. Students must complete ENVR SCI 101, and ENVR SCI 444 (8 credits) and a minimum of 8 additional credit hours selected from ENVR SCI 250, 275, 285, 335, 463, 490; GEOLOGY 230, 303, 315; NATRS 300, 312, 483, 450, 454; or any advisor approved elective. Of these 16 credit hours, 9 hours must be in upper-division work taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. This minor is not open to students majoring in Wildlife Ecology and Conservation Sciences or in Environmental and Ecosystem Sciences.

Forestry

Minimum of 16 credit hours. Required courses: NATRS 204, 300, 301, 305. Restricted electives: at least 5 credit hours selected from ENVR SCI 491, NATRS 435, 446, 450, 460, 464, SOILS 368, 468. Credit hours must include 9 hours of upper-division work taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Natural Resources

A Natural Resources Minor requires a minimum of 16 semester hours of coursework with at least 9 credit hours of NATRS or other approved courses numbered 300 or higher. This minor is not open to students majoring in Wildlife Ecology and Conservation Sciences or Environmental and Ecosystem Sciences. Credit hours for the minor must include 9 hours of upper-division work taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Rangeland Ecology and Management

Minimum of 16-17 credit hours. Required courses: NATRS 455, 460, SOIL SCI 201, and SOIL SCI 368; plus one of BIOLOGY 462, ENVR SCI 444, or NATRS 430. Credit hours for the minor must include 9 hours of upper-division work taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Wildlife Ecology

Minimum of 19 credit hours is required. Required courses: NATRS 310, 435. Restricted electives: at least 11 credit hours from NATRS 431, 441, 446, 450, or no more than one of the following: BIOLOGY 423, 428, 432. Credit hours for the minor must include 9 hours taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Description of Courses

ENVIRONMENTAL SCIENCE

ENVR SCI

- 101 [BSCI] The Environment, Human Life, and Sustainability** 4 (3-3) Interactions between humans and their environment; multidisciplinary introduction to environmental concepts and concerns.
- 250 [PSCI] Introduction to Earth System Science** 3 Course Prerequisite: ENVR SCI 101. Earth's fundamental systems (the geo-, atmo-, hydro-, and bio-spheres) in the context of global change. Recommended: BIOLOGY 106 or CHEM 105.
- 275 Rivers: Form, Function, and Management** 3 Introduction to rivers, stream ecology, and restoration.
- 285 The Science and Policy of Climate Change** 3 Course Prerequisite: ENVR SCI 101. The science of the climate system; the case for reducing greenhouse gas emissions, and the best policies to do so.

310 Modeling the Environment 4 (3-3) Construction and testing of computer simulation models of environmental systems. Cooperative: Open to UI degree-seeking students.

335 [M] Environmental Policy 3 Course Prerequisite: ENVR SCI 101. Global, national, and regional environmental issues and policy.

402 Human Health & the Environment 3 Problem-solving approach to adverse effects on human health caused by contamination of environmental media or anthropogenic changes in ecosystems.

404 [CAPS] [M] The Ecosystem 3 Course Prerequisite: ENVR SCI 101; BIOLOGY 106; BIOLOGY 372 or concurrent enrollment; junior standing. Ecosystem organization and processes; theory and applications to contemporary environmental problems.

406 Introduction to Radiological Science 3 Fundamentals of atomic physics; interactions of radiation with matter; radiation dosimetry and biology, radioecology and radiological health protection. Recommended preparation: 12 semester hours from any 2 or more of the following subjects: biology, chemistry, calculus, or physics.

410 [M] Global Biogeochemistry 3 Cycles of biogeochemically important elements and anthropogenic changes to those cycles in terrestrial and aquatic environments on a global scale. Field trip required.

417 Fisheries Science 3 Course Prerequisite: BIOLOGY 106; STAT 212 or MATH 171. Background on the development of fisheries science and examination of the natural and social scientific theories and techniques applied to the management of fisheries.

444 Environmental Assessment 4 Environmental impact statements and their national and state policy frameworks, methods of assessment, and team preparation of an impact statement. Credit not granted for both ENVR SCI 444 and ENVR SCI 544. Cooperative: Open to UI degree-seeking students.

445 Hazardous Waste Management 3 Environmental, technical, and political aspects of hazardous waste management; evaluative methods, risk assessment, and current management requirements. Credit not granted for both ENVR SCI 445 and ENVR SCI 545. Cooperative: Open to UI degree-seeking students.

460 Biotechnology and the Environment 3 Course Prerequisite: BIOLOGY 106, 107, or 120; 3 credit hours CHEM. Benefits, regulations, and human and environmental impacts of biotechnology used for crop protection, agricultural and energy production, and environmental remediation and management. (Crosslisted course offered as ENTOM 460, ENVR SCI 460).

463 Water in the Environment 3 Water flows in the natural environment, including cloud formation, rainfall, evaporation, infiltration, groundwater, river flows, lakes, estuaries, mixing, and erosion.

464 Introductory Physical Oceanography 3 Course Prerequisite: MATH 140, PHYSICS 101, or graduate standing. Climate, ocean currents, waves, mixing, and erosion, driven by salinity, temperature, winds, gravity, and earth's rotation.

465 Aquatic Microbial Ecology 2 Course Prerequisite: BIOLOGY 372; by permission of the instructor. Biological, ecological and environmental impact of microbes in aquatic systems.

469 Ecosystem Ecology and Global Change 3 Historic and current factors controlling the function of ecosystems and their responses to natural and human caused global change. (Crosslisted course offered as BIOLOGY 469, ENVR SCI 469, BIOLOGY 569, ENVR SCI 569). Credit not granted for both BIOLOGY 469 and 569, or ENVR SCI 469 and 569. Cooperative: Open to UI degree-seeking students.

483 Sustainability: Applied Improvement or Promotion Projects 2 Course Prerequisite: Senior standing; minimum 3 credits of [PSCI] or [BSCI]. An applied multidisciplinary introduction to sustainability; classroom learning followed with an applied sustainability improvement or promotion project for Washington State University.

486 GIS Spatial Analysis 4 (2-6) Course Prerequisite: SOIL SCI 368. Geographic information systems applied to analysis of landscape data; maps, geographic coordinate systems and projections, geodatabases. (Crosslisted course offered as SOIL SCI 468, SOIL SCI 568, ENVR SCI 486, ENVR SCI 586). Credit not granted for both SOIL SCI 468 and 568, or ENVR SCI 486 and 586.

490 Special Topics V 1-3 May be repeated for credit; cumulative maximum 6 hours.

491 Senior Seminar 1 Course Prerequisite: Certified major in Environmental Science and Regional Planning; senior standing, or graduate standing.

492 Special Topics V 1-3 May be repeated for credit; cumulative maximum 12 hours. Specialized topics within the discipline; content will vary each term. Cooperative: Open to UI degree-seeking students.

495 Undergraduate Internship V 1-12 May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: By interview only. Practical experience in appropriate agencies; for career students in environmental science.

499 Special Problems V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.

501 Graduate Skills Seminar 1 Seminar designed to introduce first year graduate students to the science graduate program; roles and responsibilities of graduate students, teaching assistants and researchers. S, F grading.

- 504 Ecosystem Management** 3 Analysis of ecosystem processes; dual emphasis on ecological principles and development of methods and concepts to evaluate policies for management.
- 510 Species Distribution Modeling** 3 Theory and application of species distribution models, including niche, occupancy, and spatial capture-recapture models; manipulation of spatial data and software packages (ArcGIS, R, MaxEnt, PRESENCE). Cooperative: Open to UI degree-seeking students.
- 520 Radiation Instrumentation** 3 (2-3) Methods for analysis of radiation and radiative materials, including use of radiation monitoring equipment and analysis of instrument data. Required preparation: ENVR SCI 406.
- 521 Uses and Regulation of Radiation** 3 Uses and regulation of radiation and radioactive materials in medicine, industry, power production, and scientific research. Required preparation: ENVR SCI 406.
- 522 Radiation Biology and Ecology** 3 Biology and physics of the irradiation of living systems, using past and present radiological studies as examples. Required preparation: 3 hours of general biology; ENVR SCI 406.
- 523 Environmental and Internal Dosimetry** 3 (2-3) Critical analysis of environmental and individual radiation doses, including use of dose estimation models based on international standards. Required preparation: ENVR SCI 406.
- 531 Fundamentals of Environmental Toxicology** 3 Fundamentals of toxicology; environmental fate and biological deposition and effects of natural products, drugs, food chemicals, and pollutants.
- 532 Applied Environmental Toxicology** 3 Course Prerequisite: ENVR SCI 531 or PHARMSCI 505. Overview of the field of environmental toxicology; interactions of xenobiotics with natural systems.
- 540 Agroecology** 3 Social and ecological aspects of agriculture and human food systems.
- 544 Environmental Assessment** 4 Environmental impact statements and their national and state policy frameworks, methods of assessment, and team preparation of an impact statement. Credit not granted for both ENVR SCI 444 and ENVR SCI 544. Cooperative: Open to UI degree-seeking students.
- 545 Hazardous Waste Management** 3 Environmental, technical, and political aspects of hazardous waste management; evaluative methods, risk assessment, and current management requirements. Credit not granted for both ENVR SCI 445 and ENVR SCI 545. Cooperative: Open to UI degree-seeking students.
- 550 System Dynamics Models of Environmental Systems** 3 Analysis of environmental system dynamics; development and uses of simulation models using the Stella software on Macintosh. Cooperative: Open to UI degree-seeking students.
- 569 Ecosystem Ecology and Global Change** 3 Historic and current factors controlling the function of ecosystems and their responses to natural and human caused global change. (Crosslisted course offered as BIOLOGY 469, ENVR SCI 469, BIOLOGY 569, ENVR SCI 569). Credit not granted for both BIOLOGY 469 and 569, or ENVR SCI 469 and 569. Cooperative: Open to UI degree-seeking students.
- 585 Aquatic System Restoration** 3 Study of natural, damaged and constructed ecosystems with emphasis on water quality protection and restoration of lakes, rivers, streams and wetlands. (Crosslisted course offered as CE 585, BSYSE 554, ENVR SCI 585). Required preparation must include CHEM 345; MBIOS 101. Required preparation must include CHEM 345; MBIOS 101. Cooperative: Open to UI degree-seeking students.
- 586 GIS Spatial Analysis** 4 (2-6) Geographic information systems applied to analysis of landscape data; maps, geographic coordinate systems and projections, geodatabases. (Crosslisted course offered as SOIL SCI 468, SOIL SCI 568, ENVR SCI 486, ENVR SCI 586). Credit not granted for both SOIL SCI 468 and 568, or ENVR SCI 486 and 586.
- 590 Special Topics** 2 May be repeated for credit; cumulative maximum 6 hours. Cooperative: Open to UI degree-seeking students.
- 592 Special Topics** V 1-4 May be repeated for credit; cumulative maximum 4 hours.
- 593 Seminar in Environmental Science and Regional Planning** 1 May be repeated for credit; cumulative maximum 8 hours. May be repeated for credit, cumulative maximum 8 hours.
- 600 Special Projects or Independent Study** V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination** V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 702 Master's Special Problems, Directed Study, and/or Examination** V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.
- 800 Doctoral Research, Dissertation, and/or Examination** V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Environmental and Natural Resource Sciences PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

GEOLOGY**GEOLOGY**

- 101 [PSCI] Introduction to Geology** 4 (3-3) Introductory physical geology for non-science majors; emphasis on western US. Credit not granted for more than one of GEOLOGY 101, 102, 180.
- 102 Physical Geology** 4 (3-3) Course Prerequisite: MATH 106 or concurrent enrollment. Modern concepts of earth science; mineral rock, resource, and map study. Field trip required. Credit not granted for both GEOLOGY 101 and 102.
- 103 [PSCI] Other Worlds: Comparative Planetology of our Solar System** 3 Study of the geological processes and environments on planets and moons of our solar system.
- 210 [PSCI] Earth's History and Evolution** 4 (3-3) Introduction to earth's history and evolution through observations, data collection and analysis, readings and writing exercises. Two field trips required.
- 221 Field Trip** 1 (0-3) May be repeated for credit. Course Prerequisite: GEOLOGY 210. One-week field trip to study geology of a selected area of the western United States. S, F grading.
- 230 [PSCI] Introductory Oceanography** 3 Interdisciplinary study of ocean systems: marine geology, chemistry, physics and biology; oceans' influence on climate and response to human activity.
- 285 Introduction to Astrobiology** 3 Origins, distribution, evolution and future of life in the universe.
- 303 Environmental Geology** 3 Course Prerequisite: GEOLOGY 101 or 102. Geological hazards and geologic problems associated with human activities. Required field trip.
- 307 Geology Field Camp** 3 (0-9) Course Prerequisite: GEOLOGY 101; GEOLOGY 210. Introduction to geologic field methods; basic geologic mapping.
- 315 Water and the Earth** 3 (2-3) Course Prerequisite: CHEM 102 or 106; one of MATH 108, 140, 171, 172, 182, 201, 202, ENGR 107, or a minimum ALEKS math placement score of 70%; and one of GEOLOGY 101, GEOLOGY 102, PHYSICS 101, or PHYSICS 201. Global hydrologic cycle, including rivers and weathering, groundwater, rainwater and the atmosphere, oceans, human impacts. Field research required.

- 320 Sedimentary Petrology and Sedimentation** 3 (2-3) Course Prerequisite: GEOLOGY 210; GEOLOGY 350. Sedimentary rock composition and origins applying fundamental principles of sedimentology. Field trip required.
- 322 Geology of the Pacific Northwest** 3 Course Prerequisite: GEOLOGY 101 or 102. Physical geology of the Pacific Northwest focusing on geological processes important in its evolution. Field trips required. Credit not granted for both GEOLOGY 322 and 323.
- 323 Geology of the Pacific Northwest** 4 (3-3) Course Prerequisite: GEOLOGY 101 or 102. Physical geology of the Pacific Northwest focusing on geological processes important to its evolution. Field trips required. Credit not granted for both GEOLOGY 322 and 323.
- 340 [M] Geologic Structures** 4 (3-3) Course Prerequisite: GEOLOGY 210; MATH 107. Basic understanding and techniques of working in deformed rocks in mountain belts. Field trip required.
- 350 Mineralogy and Crystallography** 4 (2-6) Course Prerequisite: CHEM 101 or 105; GEOLOGY 101, 102, or 210. Composition, physical properties, structure, crystallography, identification, and origin of minerals. Field trip required.
- 356 Igneous and Metamorphic Petrology** 4 (2-6) Course Prerequisite: GEOLOGY 350. Origin, evolution, and eruption of magmas and crustal rocks; mineralogy, textures and chemical composition of igneous and metamorphic rocks. Field trips required.
- 390 Living on the Edge: Global Climate Change and Earth History** 3 Course Prerequisite: Junior standing. Global earth system: ocean, earth, atmosphere, biosphere, and cryosphere; human impact on the climate system; climate change data predictions; debates.
- 405 Geophysics** 4 (3-3) Course Prerequisite: GEOLOGY 340. Theory and application of geophysical methods for hydrology, environmental, engineering, exploration, and structural geology; review of techniques. (Crosslisted course offered as GEOLOGY 405).
- 408 [CAPS] [M] Field Geology** 3 (0-9) Course Prerequisite: GEOLOGY 307; GEOLOGY 340; GEOLOGY 350; senior standing. Advanced field problems and methods; data interpretation and report preparation. Cooperative: Open to UI degree-seeking students.
- 445 Astrobiology** 3 Origin, evolution, distribution and future of life in the universe; fundamental concepts of life and habitable environments on Earth and other planetary bodies within and outside of the solar system. Credit not granted for both GEOLOGY 445 and GEOLOGY 545.
- 467 Volcanology** 3 (2-3) Course Prerequisite: GEOLOGY 320; GEOLOGY 356. Volcanic process, eruption mechanisms, volcanic deposits, hazard assessment. Field trip required. Credit not granted for both GEOLOGY 467 and GEOLOGY 567. Cooperative: Open to UI degree-seeking students.
- 470 Introduction to Economic Geology** 3 (2-3) Course Prerequisite: GEOLOGY 340; GEOLOGY 350. Genesis, evolution and tectonic setting of ore deposits combining theory, description, and detailed hand specimen analysis. Field trip to major mining districts. Cooperative: Open to UI degree-seeking students.
- 475 Groundwater** 3 (2-3) Course Prerequisite: CE 317 or GEOLOGY 315; MATH 140 or concurrent enrollment, or MATH 172 or 182 or concurrent enrollment. Introduction to groundwater occurrence, movement, quality, and resource management, emphasizing physical and biogeochemical principles. Field trip required. (Crosslisted course offered as GEOLOGY 475, CE 475).
- 480 Introductory Geochemistry** 3 Course Prerequisite: CHEM 106; GEOLOGY 350. The chemistry of Earth materials and processes.
- 490 Undergraduate Research** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: GEOLOGY 101; GEOLOGY 210. Research and advanced laboratory experience with a geology faculty member; oral presentation and written thesis.
- 498 Seminar** 1 May be repeated for credit; cumulative maximum 3 hours. Research papers presented by students, faculty, and visiting scientists on geological research. Credit not granted for both GEOLOGY 498 and GEOLOGY 598. S, F grading.
- 499 Special Problems** V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 505 Geophysics** 4 (3-3) Theory and application of geophysical methods for hydrology, environmental, engineering, exploration, and structural geology; review of techniques. (Crosslisted course offered as GEOLOGY 405).
- 520 Advanced Topics in Sedimentology** 3 (2-3) May be repeated for credit; cumulative maximum 6 hours. Modern aspects of sedimentary rocks. Field trip required. Cooperative: Open to UI degree-seeking students.
- 521 Clastic Depositional Systems** 3 (2-3) Clastic sedimentary environments; architectural elements and facies analysis. Field trip required. Cooperative: Open to UI degree-seeking students.
- 523 Advanced Topics in Stratigraphy** 3 May be repeated for credit. Cooperative: Open to UI degree-seeking students.
- 525 Carbonate Depositional Systems** 3 (2-3) Modern carbonate environments and processes; ancient carbonate rock sequences; carbonate platform-to-basin transition; diagenesis of carbonate rocks. Field trip required. Cooperative: Open to UI degree-seeking students.
- 538 Orogenic Systems I** 3 Field-base course examines tectonic processes active in the northern Cordillera. Field trip required and final research paper. Cooperative: Open to UI degree-seeking students.
- 540 Tectonics** 3 Nature and origin of the Earth's major tectonic features. Cooperative: Open to UI degree-seeking students.
- 541 Structural Analysis** 3 (2-3) Structural analysis of complexly deformed rocks in orogenic belts. Field trip required. Cooperative: Open to UI degree-seeking students.
- 545 Astrobiology** 3 Origin, evolution, distribution and future of life in the universe; fundamental concepts of life and habitable environments on Earth and other planetary bodies within and outside of the solar system. Credit not granted for both GEOLOGY 445 and GEOLOGY 545.
- 550 Advanced Mineralogy** 3 Elements of crystal chemistry and crystal physics. Cooperative: Open to UI degree-seeking students.
- 552 Analytical Methods in Earth Sciences** 3 (2-3) Theory and practical experience in EMPA, XRD, XRF, and ICPMS analysis. Cooperative: Open to UI degree-seeking students.
- 560 Advanced Igneous Petrology** 3 (2-3) Origin, evolution, and tectonic significance of igneous rocks. Field trip required. Cooperative: Open to UI degree-seeking students.
- 562 Watershed Biogeochemistry** 3 Sources, transformations, fates and impacts of biogeochemically important compounds as they move downstream through watersheds to the coastal zone.
- 567 Volcanology** 3 (2-3) Volcanic process, eruption mechanisms, volcanic deposits, hazard assessment. Field trip required. Credit not granted for both GEOLOGY 467 and GEOLOGY 567. Cooperative: Open to UI degree-seeking students.
- 578 Groundwater Geobiology** 3 (2-3) Interaction of groundwater geology and the environment including microbial populations with emphasis on microbial transport in the sub-surface and bioremediation approaches.
- 579 Groundwater Geochemistry** V 2-4 May be repeated for credit; cumulative maximum 4 hours. Organic and inorganic aqueous geochemistry; controls on groundwater contaminant fate. Cooperative: Open to UI degree-seeking students.
- 583 Radiogenic Isotopes and Geochronology** 3 Radiogenic isotopes and their uses as chronometers (radiometric dating) and as tracers of earth evolution and differentiation. Cooperative: Open to UI degree-seeking students.
- 584 Stable Isotope Geochemistry** 3 Principles and applications of isotope geochemistry in the geological sciences. Cooperative: Open to UI degree-seeking students.
- 588 Methods in Radiogenic Isotope Geochemistry** 3 (1-6) Course Prerequisite: GEOLOGY 583. Laboratory-based course in modern analytical methods in radiogenic isotope geochemistry.

- 595 Advanced Topics in Geology V** 1-4 May be repeated for credit; cumulative maximum 6 hours. Topics of current interest in geology.
- 596 Advanced Topics in Geology V** 1-4 May be repeated for credit; cumulative maximum 6 hours. Topics of current interest in geology.
- 597 Advanced Topics in Geology V** 1-4 May be repeated for credit; cumulative maximum 6 hours. Topics of current interest in geology.
- 598 Seminar 1** May be repeated for credit; cumulative maximum 3 hours. Research papers presented by students, faculty, and visiting scientists on geological research. Credit not granted for both GEOLOGY 498 and GEOLOGY 598. S, F grading.
- 700 Master's Research, Thesis, and/or Examination V** 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 702 Master's Special Problems, Directed Study, and/or Examination V** 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.
- 800 Doctoral Research, Dissertation, and/or Examination V** 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Geology PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.
- NATURAL RESOURCE SCIENCES**
- NATRS**
- 100 Introduction to Natural Resource Management I** 1 Nature and significance of natural resources; types of renewable natural resource systems; goals and principles of natural resource management.
- 204 Introduction to Measurements and Computers in Natural Resources 2** (1-3) Course Prerequisite: MATH 107, MATH 106/108, MATH 108 concurrent enrollment if 106 is complete, MATH 140, MATH 171, or MATH 202. Introduction to basic concepts, field techniques and the use of spread sheets in natural resources. Field trips required.
- 300 Natural Resource Ecology 3** Ecology as applied to management of natural resource ecosystems; biological diversity, conservation biology, global climate change in natural resource ecology. Field trips required.
- 301 Forest Plants and Ecosystems 3** (2-3) Course Prerequisite: NATRS 300 or concurrent enrollment. Identification and ecology of forest plants with emphasis on trees and the ecosystems in which they occur. Field trips required.
- 302 Arid Land Plants and Ecosystems 3** (2-3) Course Prerequisite: NATRS 301. Identification and ecology of arid land plants (trees, shrubs, grasses, forbs) and the ecosystems in which they occur. Field trips required.
- 304 Ecosystem Field Measurements 4** (3-3) Course Prerequisites: NATRS 204; NATRS 300 or concurrent enrollment; NATRS 301 or concurrent enrollment. Fixed-area sampling and analytical techniques for assessing count and continuous variables are presented; variable radius sampling methods for forests and biomass estimation procedures for grassland and shrub lands are introduced.
- 305 Silviculture 3** Stand dynamics, natural regeneration methods, intermediate stand treatment, relationships of natural resource management to silvicultural practice. Field trips required.
- 310 Methods in Wildlife Ecology 4** (3-3) Course Prerequisite: BIOLOGY 106; BIOLOGY 107. Field and laboratory sampling techniques in wildlife research and management.
- 312 [DIVR] Natural Resources, Society, and the Environment 3** Social views of natural resources; processes by which these views are developed and expressed; social conflict over natural resources.
- 318 Wildlife Genetics 3** Course Prerequisite: BIOLOGY 106; BIOLOGY 107; MATH 106 or 107. Application of genetic tools for wildlife conservation and management, including forensics, detection of rare species, and population estimation. Cooperative: Open to UI degree-seeking students.
- 404 Sampling for Terrestrial Ecosystem Management 3** (2-3) Course Prerequisites: NATRS 204; STAT 212 or 412. Simple random sampling, stratified sampling, and sampling in proportion to importance; foundation presented for selecting a sampling scheme, implementing it in the field, and assessing variance.
- 411 [M] Limnology and Aquatic Ecosystem Management 3** (2-3) Introduction to the science and management of aquatic ecosystems, emphasizing lakes.
- 419 Topics in Natural Resource Sciences V** 1-3 May be repeated for credit; cumulative maximum 9 hours. Topical issues in natural resource sciences.
- 430 Introduction to Wildland Fire 3** Course Prerequisite: NATRS 301. Physical nature and behavior of wildland fire; the fire environment; fire ecology; practice of wildland fire management. Field trip required.
- 431 Wildlife Nutrition 3** (2-3) Nutritional requirements and interactions of wildlife populations. Cooperative: Open to UI degree-seeking students.
- 435 Wildlife Ecology 4** (3-3) Course Prerequisite: BIOLOGY 372 or NATRS 300; STAT 212 or 412; junior standing. The ecology of wildlife species and the contributing biological processes. Overnight field trip required.
- 438 Natural Resource and Environmental Policy and Law 3** Course Prerequisite: Junior standing. Development, content and implementation of natural resources and environmental policy and law in the U.S. Emphasis on both historical development and current issues in this field. Recommended preparation: NATRS 312.
- 441 Population Ecology and Conservation 4** (3-3) Course Prerequisite: BIOLOGY 372 or NATRS 300; STAT 212 or 412. Ecology, conservation, management of vertebrate populations, especially threatened and endangered species; designed for wildlife and conservation biology majors.
- 446 [M] Wildlife Habitat Ecology 3** (2-3) Course Prerequisite: SOIL SCI 368. The ecology of how wildlife use, respond to, and affect resources in their environment.
- 450 [M] Conservation Biology 3** Course Prerequisite: Junior standing. Patterns of biological diversity, factors producing changes in diversity, values of diversity, management principles applied to small populations, protected areas, landscape linkages, biotic integrity, restoration, legal issues and funding sources. Credit not granted for both NATRS 450 and NATRS 550.
- 454 [CAPS] [M] Restoration Ecology 3** (2-3) Course Prerequisite: Senior standing. Ecological principles used to restore biological communities; ecological processes and species on degraded landscapes.
- 455 Elements of Range Management Sciences 3** Course Prerequisite: BIOLOGY 107. Systems science, ecology, wildlife, livestock, social science, concept design, and their contributions to a management science involving rangelands.
- 460 Watershed Management 3** Principles and practices of management of forest and rangelands for protection, maintenance, and improvement of water resource values. Field trip required. Recommended preparation: NATRS 204 or sufficient background in spreadsheets.
- 464 [M] Landscape Ecology 3** (2-3) Course Prerequisite: Junior standing. Linkages between spatial patterns and processes in a variety of landscapes and the qualitative tools used in the investigation of these linkages.
- 479 Natural Resource Management Internship V** 2-12 May be repeated for credit; cumulative maximum 12 hours. An elective opportunity for select students to supplement their academic training with practical field experience.

485 Disturbance Ecology 3 (2-3) Course Prerequisite: NATRS 204; NATRS 301; NATRS 302 or concurrent enrollment. Fire, disease, and other disturbances are primary drivers of structure and composition in terrestrial ecosystems; study of management of insect outbreaks and fungal organisms in combination with fire and other disturbances.

519 Advanced Topics V 1-3 May be repeated for credit; cumulative maximum 6 hours.

535 Wildlife Ecology 4 (3-3) The ecology of wildlife species and the contributing biological processes. Overnight field trip required.

550 [M] Conservation Biology 3 Patterns of biological diversity, factors producing changes in diversity, values of diversity, management principles applied to small populations, protected areas, landscape linkages, biotic integrity, restoration, legal issues and funding sources. Credit not granted for both NATRS 450 and NATRS 550.

556 Foraging Ecology of Herbivores 2 Synthesis of foraging behavior concepts including nutritive quality of forages, digestive and metabolic constraints, and diet and habitat selection. Cooperative: Open to UI degree-seeking students.

560 Watershed Management 3 Principles and practices of management of forest and rangelands for protection, maintenance, and improvement of water resource values. Field trip required. Recommended preparation: NATRS 204 or sufficient background in spreadsheets.

594 Environmental and Natural Resources Issues and Ethics 3 Ethical systems applied to natural resources; issues of professionalism and ethics in natural resource management. Cooperative: Open to UI degree-seeking students.

595 Seminar in Natural Resource Sciences 1 May be repeated for credit. Literature review; preparation and presentation of reports in natural resource sciences.

700 Master's Research, Thesis, and/or Examination V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Environmental and Natural Resource Sciences PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Department of Fine Arts

finearts.wsu.edu
FA Center 5072
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Associate Professor and Department Chair, S. Meisel; Professors, T. Brown, K. Haas; Associate Professors, A. Bawa (Vancouver), D. DeHart, D. Gast (Tri-Cities), H. Higgs (Vancouver), M. Holloman, M. Kinkel, I. Palmer, R. Safavi; Assistant Professors, P. Christenson (Tri-Cities), J. Hedges; Instructors, Z. Kolden, H. Meredith, H. Okumura, A. Rocha.

The Fine Arts Department provides a range of experiences in the visual arts. The department offers diverse courses of study leading to the degrees of Bachelor of Arts in Fine Arts (within this degree, there are two options: an Art Studio option, and an Art History option), Bachelor of Fine Arts and Master of Fine Arts. The Bachelor of Arts and Bachelor of Fine Arts programs are designed to open doors into the world of visual expression and intellectual development. In particular, we encourage students to sample a variety of art disciplines and make an informed choice about their direction in art. The department includes seven areas of emphasis within which to develop a program: drawing, painting, sculpture, printmaking, ceramics, photography, digital media and interdisciplinary studies. These are supported by a strong art history component.

Students with a BA in Fine Arts - Art Studio Option, should have a broad understanding of the visual arts with an understanding of arts-related concepts/terms (including subject matter, form, and content) and basic studio production, a grounding in art history, and an awareness of contemporary trends in art and theory. They should be able to articulate in visual form a range of approaches, from a representational point of view through a more conceptual focus, make critical judgments about contemporary art and culture, and have an acceptable command of verbal and written expression.

Students with a BA in Fine Arts - Art History Option are given broad exposure to the history of the visual arts. As an interdisciplinary field, art history is an intellectual arena in which students develop their perceptual skills and analytical tools to engage diverse art forms from multiple perspectives. Students begin with foundation survey courses, the History of World Art (FA 201 and FA 202), and then take upper-division courses to consider art from specific cultures and historical time periods. In these courses, students gain familiarity with contextual issues concerning the production and consumption of art. They develop research and writing skills necessary to think critically about art and visual culture. Students are also introduced to basic aspects of studio production to enhance their visual skills and knowledge of material practices. Students complete their studies by writing a thesis paper and developing knowledge of one foreign language.

Students with a BFA should have a working knowledge of the processes and media that produce works of visual art, including a clear understanding of the terms: subject matter, form, and content, as well as specialized technical, conceptual and imaginative expertise in a given field. They should be able to articulate in visual form a range of approaches, from a representational point of view through a more conceptual focus, make critical

judgments about contemporary art and culture, and have an acceptable command of verbal and written expression.

Certification Process

Prospective applicants for certification are responsible for acquainting themselves with all requirements and procedures. Details including specific course requirements and portfolio submission are available in the departmental office.

Transfer Credits

The Department of Fine Arts will accept up to 18 credit hours in art toward the major and 9 credit hours in art toward the minor.

Exchange Program

The Department of Fine Arts has a tuition-free exchange for four students with the School of Fine Arts at Nihon University, Tokyo, Japan. All art majors at WSU are eligible for this one-year study in Japan. Selection is made in the winter. Other opportunities for undergraduate study abroad in Europe, Australia, and the Far East are available from the Office of International Programs.

Graduate Study

The MFA program at Washington State University is a two-year interdisciplinary program where students may focus in, but are not limited to, ceramics, drawing, digital media, painting, photography, printmaking, and sculpture. Emphasis is placed on personal and conceptual artistic development in light of contemporary art practices. Graduates meet with faculty for one-on-one studio discussions. First year students have an exhibition in the departmental gallery and the second year program culminates in a thesis exhibition held in the Museum of Art. A final oral examination and a thesis document are also required. The degree requires 57 graded credit hours and 5 credit hours of thesis work (FA 700) totaling 62 credits.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

BACHELOR OF ARTS IN FINE ARTS - ART HISTORY OPTION (120 HOURS)

Certification requirements:

- 1) FINE ART 102 or 103;
- 2) 9 hours from 200-300-level art history courses;
- 3) 2.0 cumulative GPA in FINE ART courses.

For the Bachelor of Arts in Fine Arts a total of at least 48 hours of FINE ARTS with a minimum cumulative GPA of 2.0 is required; 30 of these hours must be in 300-400-level courses.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
ENGLISH 101 [WRTG]	3

FINE ART 102	3
FINE ART 201 [ARTS]	3
Social Sciences [SSCI]	3

<i>Second Term</i>	<i>Hours</i>
FINE ART 103	3
HISTORY 105 [ROOT]	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4
Quantitative Reasoning [QUAN]	3 or 4
Electives	3

Second Year

<i>First Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
Diversity [DIVR]	3
Foreign Language, if necessary, and/or Electives	7

<i>Second Term</i>	<i>Hours</i>
FINE ART 202 [ARTS]	3
Humanities [HUM]	3
Foreign Language, if necessary, and/or Electives	9
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
FINE ART 301, 302 [M], or 404 [M]	3
FINE ART 303	3
FINE ART Studio Elective ²	3
300-400-level Electives	4
Electives	3

<i>Second Term</i>	<i>Hours</i>
FINE ART [M] Course	3
FINE ART 304	3
300-400-level Art History Elective ³	3
Electives	5

Fourth Year

<i>First Term</i>	<i>Hours</i>
FINE ART [M] Course, if needed, or Electives	3
FINE ART 408 [CAPS]	3
300-400-level Art History Electives ³	6
300-400-level Elective	3

<i>Second Term</i>	<i>Hours</i>
FINE ART 408	3
300-400-level Art History Electives ³	6
300-400-level Electives	6

¹To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

²FINE ART studio electives are FINE ART 110, 320, 332, 340, 350, 370, or 381.

³300-400-level Art History Electives are AMER ST 473; ANTH 301; FINE ART 301, 302 [M], 305 [M], 307 [M], 308 [M], 331, 380, 401, 403 [M], 404 [M], 405 [M], 490, 498 [M], 499; PHIL 431, or as approved by advisor.

BACHELOR OF ARTS IN FINE ARTS - STUDIO OPTION (120 HOURS)

Certification requirements:

- 1) FINE ART 102 or 103;
 - 2) 9 hours from 200-300-level art history courses;
 - 3) 2.0 cumulative GPA in FINE ART courses.
- For the Bachelor of Arts in Fine Arts a total of at least 48 hours of FINE ARTS with a minimum cumulative GPA of 2.0 is required; 30 of these hours must be in 300-400-level courses.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
ENGLISH 101 [WRTG]	3
FINE ART 102	3
FINE ART 110	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
FINE ART 103	3
FINE ART 111, 312, 320, or 370	3
FINE ART 201 [ARTS]	3
HISTORY 105 [ROOT]	3
Quantitative Reasoning [QUAN]	3 or 4

Second Year

<i>First Term</i>	<i>Hours</i>
Diversity [DIVR]	3
FINE ART 340 or 350	3
Humanities [HUM]	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4
Foreign Language, if necessary, or Elective	3 or 4

<i>Second Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
FINE ART 202 [ARTS]	3
FINE ART 332, 333, or 381	3
Foreign Language, if necessary, and/or Electives	6
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
300-400-level FINE ART Elective	3
FINE ART 303	3
Social Sciences [SSCI]	3
Electives	6

<i>Second Term</i>	<i>Hours</i>
300-400-level FINE ART Elective	3
FINE ART 304	3
Electives	9

Fourth Year

<i>First Term</i>	<i>Hours</i>
300-400-level Electives	6
300-400-level FINE ART Elective	3
FINE ART [M] Course	3
Integrated Capstone [CAPS]	3

<i>Second Term</i>	<i>Hours</i>
300-400-level Electives	7

300-400-level FINE ART Elective	3
FINE ART [M] Course	3

¹To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

BACHELOR OF FINE ARTS (BFA) (120 HOURS)

For the degree Bachelor of Fine Arts a total of at least 70 hours in FINE ARTS are required; 46 of these must be in 300-400-level courses.

Certification requirements (students should prepare for BFA certification during fall semester of the junior year):

- 1) FINE ART 102, 103 and 110;
- 2) FINE ART 201 and 202;
- 3) One course from 2D area (FINE ART 111, 312, 320 or 370);
- 4) One course from 3D area (FINE ART 340 or 350);
- 5) One course from media arts areas (FINE ART 332, 333 or 381);
- 6) 6 additional hours in major emphasis;
- 7) 2.0 cumulative GPA in FINE ART courses;
- 8) Slide portfolio and exhibit presentation of original art work.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
ENGLISH 101 [WRTG]	3
FINE ART 102	3
FINE ART 110	3
Quantitative Reasoning [QUAN]	3 or 4

<i>Second Term</i>	<i>Hours</i>
FINE ART 103	3
FINE ART 111, 312, 320, or 370	3
FINE ART 201 [ARTS]	3
HISTORY 105 [ROOT]	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4

Second Year

<i>First Term</i>	<i>Hours</i>
300-400-level FINE ART Elective	3
Communication [COMM] or Written Communication [WRTG]	3
Diversity [DIVR]	3
FINE ART 340 or 350	3
Foreign Language or Electives	3 or 4

<i>Second Term</i>	<i>Hours</i>
300-400-level FINE ART Elective	3
FINE ART 202 [ARTS]	3
FINE ART 332, 333, or 381	3
Foreign Language and/or Electives	6
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
300-400-level FINE ART Elective	3
FINE ART 303	3

FINE ART 312	3
Social Sciences [SSCI]	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
300-400-level FINE ART Electives	6
FINE ART 304	3
Humanities [HUM]	3
Electives	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
300-400-level FINE ART Electives	9
FINE ART 498 [M]	3
Integrated Capstone [CAPS]	3

<i>Second Term</i>	<i>Hours</i>
300-400-level FINE ART Electives	3
FINE ART [M]	3
FINE ART 493	4
Electives	3

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

Minors

Art

A minor in art requires 18 hours including FINE ART 102 or FINE ART 103; FINE ART 110; and one course from FINE ART 201 or 202. The remaining 9 hours of electives must be in 300-400-level FINE ART courses taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Art History

A minor in art history requires 18 hours including FINE ART 201 and 202. The remaining 12 hours of electives must be in 300-400-level art history courses. 9 hours of upper-division work must be taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Description of Courses

FINE ARTS

FINE ART

- 101 [ARTS] Introduction to Art** 3 Course Prerequisite: For non-majors only. For non-majors. Appreciation of various visual art forms; emphasis on contemporary period.
- 102 [ARTS] Visual Concepts I** 3 (0-6) Introduction to visual and conceptual studio art practice through an interdisciplinary approach to two-dimensional space.
- 103 [ARTS] Visual Concepts II** 3 (0-6) Introduction to visual and conceptual studio art practice through an interdisciplinary approach to three-dimensional space.

- 110 Drawing** 3 (0-6) Composition in pictorial space, visualization of ideas, drawing from life.
- 111 Figure Drawing** 3 (0-6) Course Prerequisite: FINE ART 102 or 110. Introduction to drawing the human figure.
- 201 [ARTS] World Art History I** 3 Art and architecture of Western and Non-Western cultures from approximately 3000 BCE to 1300 CE.
- 202 [ARTS] World Art History II** 3 Art and architecture of Western and Non-Western cultures from 1300 to 2010.
- 301 Arts of Native North America** 3 Diversity of visual forms, traditional and contemporary, within changing historical and cultural contexts.
- 302 [M] Arts of Asia** 3 Art and architecture of India, China and Japan within their historical, religious and cultural contexts. (Crosslisted course offered as FINE ART 302, ASIA 302).
- 303 [ARTS] Modern Art-19th Century** 3 History of 19th century art in Europe and the United States.
- 304 Modern Art-20th Century** 3 Modern art in the 20th century.
- 305 [ARTS] [M] Arts of Ancient Greece and Rome** 3 Course Prerequisite: FINE ART 201 or concurrent enrollment. The arts of ancient Greece, Etruria, and Rome from the Greek Dark Ages to the early Christian era.
- 307 [ARTS] [M] The Arts of Renaissance Europe** 3 Course Prerequisite: FINE ART 202 or concurrent enrollment. The arts of southern and northern Europe from 1300 to 1550.
- 308 [M] Women Artists I** 3 Middle Ages through the 18th century. (Crosslisted course offered as FINE ART 308, WOMEN ST 308).
- 310 [M] Women Artists II** 3 19th to 20th century. (Crosslisted course offered as FINE ART 310, WOMEN ST 310).
- 312 Advanced Drawing** 3 (0-6) May be repeated for credit. Course Prerequisite: FINE ART 110. Advanced projects using drawing media and process.
- 313 Drawing from the Body** 3 (0-6) May be repeated for credit. Course Prerequisite: FINE ART 111. Continuation of FINE ART 111. Contemporary discourse surrounding the body; exploration through the practice of drawing and performative actions.
- 320 Beginning Painting** 3 (0-6) Course Prerequisite: FINE ART 110. Introduction to problems in painting; development of composition and color.
- 321 Intermediate Painting** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours. Course Prerequisite: FINE ART 320. Problems and ideas in painting.
- 331 Art, Science, and Technology** 3 Course Prerequisite: Certified major or minor in Fine Art, or DTC majors and minors. Survey of art's relationship to science and technology from Renaissance to present day; emphasis on historical overview and cultural implications.

- 332 Introduction to Digital Media - Print and Web** 3 (0-6) Course Prerequisite: FINE ART 102 or concurrent enrollment, or FINE ART 103 or concurrent enrollment, or FINE ART 110 or concurrent enrollment. Introduction to principles and processes of digital media through print and web based projects; emphasis on theoretical investigations, conceptual development
- 333 Introduction to Digital Media - Video and Sound** 3 (0-6) Course Prerequisite: FINE ART 102 or concurrent enrollment, or FINE ART 103 or concurrent enrollment, or FINE ART 110 or concurrent enrollment. Principles and processes of digital media through video and sound-based projects; theoretical investigations and conceptual development.
- 337 Experimental Animation** 3 (2-2) Digital and analog animation techniques; conceptual development of narrative structures. (Crosslisted course offered as ENGLISH 337, FINE ART 337).
- 340 [ARTS] Ceramics** 3 (0-6) Course Prerequisite: FINE ART 103 or 110. Hand building processes; glazing; firing.
- 341 Intermediate Ceramics** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours. Course Prerequisite: FINE ART 340.
- 350 [ARTS] Sculpture** 3 (0-6) Course Prerequisite: FINE ART 103 or 110. Composition of form in the three-dimensional space.
- 351 Intermediate Sculpture** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours. Course Prerequisite: FINE ART 350. May be repeated for credit; cumulative maximum 9 hours.
- 361 Special Topics - Drawing** V 1-6 May be repeated for credit.
- 362 Special Topics - Painting** V 1-6 May be repeated for credit.
- 363 Special Topics - Digital Media** V 1-6 May be repeated for credit.
- 364 Special Topics - Ceramics** V 1-6 May be repeated for credit.
- 365 Special Topics - Sculpture** V 1-6 May be repeated for credit.
- 366 Special Topics - Printmaking** V 1-6
- 367 Special Topics - Photography** V 1-6 May be repeated for credit.
- 369 Apparel Illustration and Rendering** 3 (0-6) Illustration and rendering used for costume and fashion design. (Crosslisted course offered as AMDT 368, FINE ART 369).
- 370 Introduction to Printmaking** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours. Course Prerequisite: FINE ART 102. Introduction to the fundamentals of printmaking, incorporating drawing, painting and collage; processes may include lithography, etching, relief and monotype.
- 371 Screenprinting** 3 (0-6) Course Prerequisite: FINE ART 102. Introduction to the basic techniques, processes and history of screenprinting; collage, repetition, multiples, hand-drawn, photo and digital processes.

- 380 History of Photography** 3 Historical survey of photography from its invention to the present; conceptual, cultural, and technical implications of the medium.
- 381 Beginning Photography** 3 (0-6) Fundamentals in digital photography in conjunction with image editing and printing techniques; formal, conceptual, and aesthetic concepts introduced. Cooperative: Open to UI degree-seeking students.
- 382 Intermediate Photography** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours. Course Prerequisite: FINE ART 381. Expansion of conceptual and technical development with photography including location and studio lighting and camera techniques; research and portfolio development. Cooperative: Open to UI degree-seeking students.
- 385 Digital Imaging** 3 (0-6) May be repeated for credit; cumulative maximum 9 hours. Course Prerequisite: FINE ART 332 or 381. Intermediate principles and processes of digital imaging workflow including software, image compositing, color management and output options.
- 401 Special Topics - Art History** V 1-6 May be repeated for credit.
- 403 [M] Modern Theories of Art** 3 May be repeated for credit; cumulative maximum 6 hours. Selected topics in 19th and 20th century theories of art.
- 404 [M] Advanced Non-western Art History** 3 May be repeated for credit; cumulative maximum 6 hours. Different topics related to the arts in Africa the Americas, Oceania, and Asia.
- 405 [M] Contemporary Art: Theory and Practice** 3 Contemporary theories of art and how those theories are developed.
- 408 [CAPS] Art History Thesis** 3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Certified major in Fine Arts, with an Art History option; junior standing. Thesis directed by student's department; original research paper regarding visual culture using art historical research skills.
- 423 Advanced Painting** V 3 (0-6) to 6 (0-12) May be repeated for credit. Course Prerequisite: FINE ART 321; certified major in Fine Arts. Continuation of FINE ART 321. Advanced problems in painting. Six credits only with permission of instructor.
- 433 Print Based Media** 3 (0-6) May be repeated for credit. Course Prerequisite: FINE ART 332. Principles and processes of visual communication in digital print; may include typography, image/text relationships, layout design and book arts.
- 434 Time Based Media** 3 (0-6) May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: FINE ART 333. Principles and processes of video, installation, and sound based art; emphasis on conceptual development of experimental forms.
- 435 Interactive Media** 3 (0-6) Course Prerequisite: FINE ART 332. Interactive possibilities in digital media including web-based projects, installation and physical computing.
- 442 Advanced Ceramics** V 3 (0-6) to 6 (0-12) May be repeated for credit. Course Prerequisite: FINE ART 341.
- 451 Material and Performance** 3 (2-4) Course Prerequisite: FINE ART 102, 103, 340, or 350. Studio-based class providing understanding of contemporary issues related to fiber materials and performance.
- 452 Advanced Sculpture** V 3 (0-6) to 6 (0-12) May be repeated for credit. Course Prerequisite: FINE ART 351. Six credits only with permission of instructor.
- 471 Advanced Printmaking** 3 (0-6) May be repeated for credit. Course Prerequisite: FINE ART 370 or 371. Survey of digital and photo processes for printmaking.
- 483 Advanced Photography** V 3 (0-6) to 6 (0-12) May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: FINE ART 382; certified major in Fine Arts. Advanced studio art techniques and development; research of historic and contemporary photographic trends; discussion of personal direction.
- 490 Gallery Procedures with Museum of Art** V 3 (0-6) to 6 (0-12) May be repeated for credit; cumulative maximum 9 hours. Course Prerequisite: Permission of the Museum of Art. Introduction to art museums and galleries, including practicum in exhibition preparation, installation, art handling, collections.
- 493 Senior Exhibit** 4 Course Prerequisite: Certified BFA major. Independent study involving exhibit, written thesis and oral examination working with area coordinator. S, F grading.
- 495 Fine Arts Internship** V 1-12 May be repeated for credit. Course Prerequisite: Certified major in Fine Arts. Experience in work-related fine arts environments for practical application and experience. S, F grading.
- 498 [CAPS] [M] Contemporary Issues Seminar** 3 Course Prerequisite: FINE ART 304; senior standing. Research seminar examining current issues confronting art and artists; students learn how to develop their professional art career.
- 499 Special Problems** V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 500 Graduate Art History** 2 May be repeated for credit; cumulative maximum 6 hours.
- 510 Graduate Drawing** 3 May be repeated for credit; cumulative maximum 9 hours.
- 511 Graduate Drawing** 3 May be repeated for credit; cumulative maximum 9 hours.
- 512 Graduate Drawing** 3 May be repeated for credit; cumulative maximum 9 hours.
- 520 Graduate Painting** 3 May be repeated for credit; cumulative maximum 9 hours.
- 521 Graduate Painting** 3 May be repeated for credit; cumulative maximum 9 hours.
- 522 Graduate Painting** 3 May be repeated for credit; cumulative maximum 9 hours.
- 530 Graduate Digital Media** 3 May be repeated for credit; cumulative maximum 9 hours.
- 531 Graduate Digital Media** 3 May be repeated for credit; cumulative maximum 9 hours.
- 532 Graduate Digital Media** 3 May be repeated for credit; cumulative maximum 9 hours.
- 540 Graduate Ceramics** 3 May be repeated for credit; cumulative maximum 9 hours.
- 541 Graduate Ceramics** 3 May be repeated for credit; cumulative maximum 9 hours.
- 542 Graduate Ceramics** 3 May be repeated for credit; cumulative maximum 9 hours.
- 550 Graduate Sculpture** 3 May be repeated for credit; cumulative maximum 9 hours.
- 551 Graduate Sculpture** 3 May be repeated for credit; cumulative maximum 9 hours.
- 552 Graduate Sculpture** 3 May be repeated for credit; cumulative maximum 9 hours.
- 570 Graduate Printmaking** 3 May be repeated for credit; cumulative maximum 9 hours.
- 571 Graduate Printmaking** 3 May be repeated for credit; cumulative maximum 9 hours.
- 572 Graduate Printmaking** 3 May be repeated for credit; cumulative maximum 9 hours.
- 580 Graduate Photography** 3 May be repeated for credit; cumulative maximum 9 hours.
- 581 Graduate Photography** 3 May be repeated for credit; cumulative maximum 9 hours.
- 582 Graduate Photography** 3 May be repeated for credit; cumulative maximum 9 hours.
- 598 Graduate Seminar** 2 May be repeated for credit; cumulative maximum 6 hours. Topics in contemporary issues, theory, and criticism.
- 600 Special Projects or Independent Study** V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination** V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

School of Food Science

sfs.wsu.edu

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Director, B. Rasco; Professors, C. Edwards, T. Henick-Kling, C. Ross, D. Smith; Associate Professors, J. Harbertson, M. Zhu; Assistant Professor, G. Ganjyal; Instructor, F. Younce; UI Affiliates: Professors, C. Bohach, S. Minnich, G. Moller, A. Paszczynski; Associate Professors, H. Lin, D. Ryu, G. Unlu; Assistant Professors, H. Joyner, B. Smith.

The School of Food Science (SFS), jointly administered by Washington State University and the University of Idaho, offers courses of study in the undergraduate major field of food science. Students complete a prescribed course of study leading to the Bachelor of Science in Food Science with an option in general science emphasizing areas in processing and engineering, hospitality and business management, business, science, enology, or an option in fermentation science. Graduate degrees are also offered leading to Masters in Food Science and a Doctor of Philosophy in Food Science.

Food Science

Food Science is the scientific discipline that supports the food and beverage manufacturing industry. Food Science is a multidisciplinary science that applies biology, chemistry, physics, engineering, nutrition, and other sciences to improve the safety and quality of food products; create healthy food products; and design new, safer, and more sustainable food preservation methods. Food scientists strive to improve the quality and nutrition of foods through traditional and emerging preservation technologies. Food scientists conduct research to mitigate chemical and microbial risk factors in foods and to understand the causes of food deterioration and spoilage. Food scientists are employed around the world by large and small food processing companies, food ingredient suppliers, food quality assurance and testing labs, federal and state governmental agencies, and academia. Food scientists also work with existing and emerging companies preparing organic, natural, kosher, and halal food products.

Graduates of the food science program are well positioned to meet the evolving challenges, needs, and opportunities of the food industry not only in the Pacific Northwest, but also nationally and internationally. Graduates begin careers in food quality assurance, food safety microbiology, technical sales, production management, product extension or development, regulatory affairs, or research in the food/allied industries or federal/state regulatory agencies.

Food Science students learn to convert food commodities into high quality, safe and nutritious food products. As part of the BS degree, students receive training and learn skills relative to the production, processing, preservation, safety, evaluation, and distribution of foods. The food processing industry is continually challenged to evaluate existing foods for quality, as well as the development of new foods to better meet consumer demands and the nutritional needs of the world. Students who work at the WSU Creamery can gain

practical processing and leadership skills in the state-of-the-art creamery where world-renowned Cougar Gold Cheese is made.

In the first two years of college, students enroll in science courses and complete most University Common Requirements (UCORE). In the junior and senior years, the curriculum emphasizes courses in food processing and engineering, food chemistry, food analysis, food microbiology, sensory evaluation, and other specialized areas such as the processing and manufacture of cereal and dairy products, and fermented foods. To certify into the Food Science major, complete a minimum of 24 credits hours and have a 2.0 cum GPA. Contact the Food Science Advisor to begin the process, food.science@wsu.edu.

Student Learning Outcomes

Our graduating seniors will: 1) show a depth of knowledge within Food Science that reflects an appropriate degree of specialization; 2) understand how the methods and concepts of Food Science relate to those of other disciplines, and possess the ability to engage in cross-disciplinary activities; 3) identify, summarize, and define the issue or problem at hand; 4) use information effectively to accomplish a specific purpose, using critical and creative thinking; and 5) communicate effectively with the targeted audience. See <http://sfs.wsu.edu/blog/2013/08/05/student-learning-outcomes-bs-food-science/>.

Options in Food Science

The **General Option** emphasizes open electives so students can take specific classes in their area of interest or choose a minor to complement their degree. This option prepares students to work in the food industry and related industries, government agencies, and governmental organizations. This degree is IFT accredited and provides a strong science background leading to graduate or professional degrees in various fields.

The **Fermentation Science Option** is for students interested in yeasts, bacteria and molds, the science behind fermented beverages and foods, and industrial-scale applications of fermentation technologies. This option prepares students to work in the food, supplement, and pharmaceutical sectors.

Other Opportunities

Students with specific interests can gain additional education by taking elective courses, participating in internships with food companies, and/or conducting a research project with a faculty member. Numerous summer internships are available to gain practical hands-on training. Contact your advisor for more information. Graduate programs are also available that lead to the degrees of Master of Science and Doctor of Philosophy in Food Science.

Transfer Students

Students planning to transfer to the School of Food Science should coordinate their programs of study with advisors to select courses applicable to the degree requirements. Many of the University Common Requirements (UCORE) courses and introductory chemistry, biology, and physics courses can be completed at community colleges. We especially recommend students take the appropriate

science and mathematics courses required in our first two years of study, so students are on track when transferring to WSU.

Preparation for Graduate Study

Students who identify an interest in graduate work are encouraged to contact the advisor no later than the end of the junior year so a course of study can be planned which schedules appropriate prerequisites to graduate courses and an introduction to research projects. Students from other science majors who wish to obtain an advanced degree in food science are encouraged to apply as they may be well prepared for graduate studies. Students are required to take certain core courses required of food science undergraduates in addition to those needed for their graduate program. For more complete information on our graduate program, admission requirements, and program requirements, review the School of Food Science website <http://sfs.wsu.edu/graduate-program/>. Please see faculty profiles at <http://sfs.wsu.edu/personnel/faculty-staff/> for research opportunities. Admission to the graduate program is based on ability to complete graduate-level work as evidenced by undergraduate transcripts; the compatibility of the student's objectives with faculty expertise and program objectives; and availability of graduate faculty to act as major advisor for the applicant. The School of Food Science requires GRE and TOEFL scores, in addition to admission materials required by the WSU Graduate School.

The School of Food Science welcomes inquiries about our program. Potential students can contact the School via phone (509-335-4763), email (food.science@wsu.edu), FSHN Bldg Rm 106, or visit the School of Food Science website (<http://sfs.wsu.edu>).

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

FOOD SCIENCE - FERMENTATION SCIENCE OPTION (120 HOURS)

First Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 107 [BSCI]	4
CHEM 105 [PSCI]	4
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3

<i>Second Term</i>	<i>Hours</i>
CHEM 106	4
HISTORY 105 [ROOT]	3
MATH 140 [QUAN]	4
VIT ENOL 113	3

Second Year

<i>First Term</i>	<i>Hours</i>
CHEM 345	4
COM 102 [COMM] or H D 205 [COMM]	3
PHYSICS 101	4
STAT 212	4

<i>Second Term</i>	<i>Hours</i>	First Year	
FS 220	3	<i>First Term</i>	<i>Hours</i>
FS 304	2	CHEM 105 [PSCI]	4
MBIOS 101 or MBIOS 305 and 306	4-5	Creative & Professional Arts [ARTS]	3
MBIOS 303	4	HISTORY 105 [ROOT]	3
Complete Writing Portfolio		MATH 140 [QUAN] or 171 [QUAN] ¹	4
Third Year		<i>Second Term</i>	<i>Hours</i>
<i>First Term</i>	<i>Hours</i>	BIOLOGY 107 [BSCI]	4
ECONS 101 [SSCI]	3	CHEM 106	4
FS 302 [M]	1	ENGLISH 101 [WRTG] or 105 [WRTG]	3
FS 303	3	FS 110	3
MKTG 360	3	Second Year	
Option Elective ¹	3	<i>First Term</i>	<i>Hours</i>
Electives	3	CHEM 345	4
<i>Second Term</i>	<i>Hours</i>	COM 102 [COMM] or H D 205 [COMM]	3 or 4
Diversity [DIVR]	3	ECONS 101 [SSCI]	3
FS 422	3	PHYSICS 101	4
Humanities [HUM]	3	Electives	2
Laboratory Elective ²	1	<i>Second Term</i>	<i>Hours</i>
Option Elective ¹	3	BIOLOGY 140 or 333	3
PL P/FS 301	3	FS 220	3
<i>Third Term</i>	<i>Hours</i>	MBIOS 303	4
Summer Session: FS 495 or 496	2	MBIOS 304	3
Fourth Year		MBIOS 305	3
<i>First Term</i>	<i>Hours</i>	Complete Writing Portfolio	
FS 418	1	Third Year	
FS 429	3	<i>First Term</i>	<i>Hours</i>
FS 460 ³	3	FS 302 [M]	1
FS 465	3	FS 303	3
Laboratory Elective ²	2	FS 416	3
Microbiology/Genetics Elective ⁴	3	FS 417	2
<i>Second Term</i>	<i>Hours</i>	Humanities [HUM]	3
FS 402	3	STAT 212	4
FS 405	3	<i>Second Term</i>	<i>Hours</i>
Integrative Capstone [CAPS] ⁵	3	Diversity [DIVR]	3
Electives ⁶	6	FS 422	3
		FS 423	1
		FS 432	3
		FS 433	1
		Emphasis Electives ²	3
		Fourth Year	
		<i>First Term</i>	<i>Hours</i>
		FS 460	3
		FS 461 [M]	1
		Electives	3
		Emphasis Electives ²	9
		<i>Second Term</i>	<i>Hours</i>
		FS 418	1
		FS 462	3
		FS 470	3
		FS 489 [CAPS]	3
		Emphasis Electives ²	4

¹ Option Electives (6 hours minimum): BIO ENG 350, FS 329, 432, 470, HBM 350.

² Laboratory Electives (3 hours minimum): FS 417, 423, 430, 461[M], 466.

³ HORT 435 can be substituted per advisor approval.

⁴ Microbiology/Genetics Elective (3 hours minimum): BIOLOGY/MBIOS 301, FS 416, MBIOS 450.

⁵ FS 489 is recommended, but requires FS 416 and 460 as prerequisites.

⁶ Electives may need to include [M] course to meet the University requirement of two Writing in the Major [M] courses. ENGLISH 402 [M] is recommended to fulfill this requirement.

FOOD SCIENCE - GENERAL OPTION (120 HOURS)

The general option under the food science major is for the student interested in the science of food processing, quality, safety and product development. Students gain practical training in the application of chemistry and microbiology to the processing of foods.

¹ One semester of calculus (MATH 140 or 171) is required of those students who will be competing for scholarships offered by the Institute of Food Technologists.

² Electives should be related to an area of emphasis. All courses must be selected in consultation with an academic advisor. Approved courses include ACCTG 230; ECONS 351; ENGLISH 402 [M] or 403 [M]; FS 201, 304, 401, 406, 429, 430, 464, 465, 466, 495, 496, 499, 529, 530, 564, 565; HBM 258; HORT 435; MKTG 360; or VIT ENOL 113.

Description of Courses

FOOD SCIENCE

FS

110 Introduction to Food Science 3 Chemistry, microbiology, and processing of food and food products; concepts of food preservation, packaging and marketing of foods; world food issues. Field trip may be required. Cooperative: Open to UI degree-seeking students.

201 [BSCI] Science on Your Plate 3 Course Prerequisite: One [PSCI] course or concurrent enrollment, or one [SCI] course or concurrent enrollment, or sophomore standing. Applications of science, scientific literacy, and critical thinking as related to the development and manufacture of modern food products and their use in modern civilizations. Cooperative: Open to UI degree-seeking students.

220 Food Safety and Quality 3 Regulation, safety, and wholesomeness of food products; microbiological, chemical, and physical risks associated with food; hazard analysis as related to food safety, processing and quality; sanitation and pest management principles; methods for analyzing the sensory qualities of food products; problem management associated with food quality assurance. Cooperative: Open to UI degree-seeking students.

301 Food Mycology 3 (2-3) Course Prerequisite: MBIOS 101. Survey of the biology and uses of fungi important in the production and storage of foods and beverages. (Crosslisted course offered as PL P 301, FS 301).

302 [M] Food Processing Lab 1 (0-3) Course Prerequisite: Concurrent enrollment with FS 303. Application of specialized techniques, concepts and practices of food processing. Field trip required. Cooperative: Open to UI degree-seeking students.

303 Food Processing 3 Course Prerequisite: FS 110; FS 220; MATH 140 or 171; STAT 212 or concurrent enrollment. Specialized techniques, concepts and practices of food processing. Cooperative: Open to UI degree-seeking students.

304 Cereal Chemistry and Processing 3 Course Prerequisite: BIOLOGY 107; CHEM 345. Cereal and legume structure, chemistry, and function as it relates to processing and utilization. Cooperative: Open to UI degree-seeking students.

329 Dairy Foods Composition and Quality 4 (3-3) Course Prerequisite: FS 110; CHEM 345. Introduction to the dairy processing industry. Chemistry of milk components. Standards of identity of dairy products. Quality control tests of fluid milk. Microbiology of fluid milk. Organoleptic properties of fluid milk. Chemical changes during storage. Federal, state, and international regulations applied to dairy foods. Cleaning and sanitation in dairy manufacturing plants. Dairy effluents and waste management. Two 1-day field trips required. Cooperative: Open to UI degree-seeking students.

- 401 Topics in Food Science V 1-3** May be repeated for credit; cumulative maximum 6 hours. Selected topics in food science. Cooperative: Open to UI degree-seeking students.
- 402 Industrial Fermentations 3** Course Prerequisite: MBIOS 101 or 305; MBIOS 303. Science and technology associated with industrial-scale food fermentations. Cooperative: Open to UI degree-seeking students.
- 405 Ciders and Other Fermented Foods 3 (2-3)** Course Prerequisite: FS 304; FS 465. Chemistry, microbiology, and technology associated with the production of cider, beer, and other food fermentations. Two half-day field trips required. (Crosslisted course offered as FS 405, HORT 405). Cooperative: Open to UI degree-seeking students.
- 406 Evaluation of Dairy Products I 1** Identifying defects in dairy products and relating these defects to their probable cause; remedies. Cooperative: Open to UI degree-seeking students.
- 409 Principles of Environmental Toxicology 3** Nature, properties, effects, and detection of toxic substances in the environment and in environmentally exposed species, including humans. Credit not granted for both FS 409 and 509. Recommended preparation: BIOLOGY 102 or 107; CHEM 102; CHEM 105; CHEM 106; STAT 212. Cooperative: Open to UI degree-seeking students.
- 416 Food Microbiology 3** Course Prerequisite: MBIOS 101, or MBIOS 304 and 305. Purpose for enumeration, detection and identification of microorganisms in food products; physical, chemical and environmental factors influencing growth and survival of foodborne microorganisms; pathogenic and spoilage microorganisms in food and their control. Cooperative: Open to UI degree-seeking students.
- 417 Food Microbiology Laboratory 2 (0-6)** Course Prerequisite: Concurrent enrollment in FS 416. Methods for enumeration, detection, and identification of spoilage and pathogenic microorganisms in foods. Cooperative: Open to UI degree-seeking students.
- 418 Oral Seminar in Food Science 1** May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: FS 110 or 220; junior standing; certified major in food science. Development of skills and communication tools and techniques for oral presentations of current food science research. Cooperative: Open to UI degree-seeking students.
- 422 Sensory Evaluation of Food and Wine 3** Course Prerequisite: STAT 212; FS 110 or VIT ENOL 113. Theory, principles and application of sensory evaluation techniques in appearance, aroma, flavor and texture of foods and wine. (Crosslisted course offered as FS 422, VIT ENOL 422). Credit not granted for both FS 422 and FS 522. Cooperative: Open to UI degree-seeking students.
- 423 Sensory Evaluation of Food and Wine Lab 1 (0-3)** Course Prerequisite: FS 422 or concurrent enrollment. Practical application of FS 422 including theory, principles and application of sensory evaluation techniques for appearance, aroma, flavor and texture of foods and wine. Recommended preparation: Age 21 or older. Cooperative: Open to UI degree-seeking students.
- 429 Dairy Products 3** Course Prerequisite: CHEM 345; FS 303; MBIOS 303. Dairy chemistry, microbiology, sanitation, product development and processing from cow to consumer. Credit not granted for both FS 429 and FS 529. Cooperative: Open to UI degree-seeking students.
- 430 Dairy Products Lab 1 (0-3)** Course Prerequisite: FS 429 or concurrent enrollment. Hands-on skills formulating, processing, evaluating and analyzing dairy products using communication and critical thinking skills. Cooperative: Open to UI degree-seeking students.
- 432 Food Engineering 3** Course Prerequisite: FS 303; PHYSICS 101. Food engineering for improving the efficiency of food processing operations and quality processed food; heat transfer, steam, air-vapor mixtures, refrigeration and fluid flow. Cooperative: Open to UI degree-seeking students.
- 433 Food Engineering Lab 1 (0-3)** Course Prerequisite: FS 432 or concurrent enrollment. To enhance the learning experience of the students taking FS 432 through laboratories, problem sessions and group discussions. Cooperative: Open to UI degree-seeking students.
- 436 Principles of Sustainability 3** Course Prerequisite: Junior standing. Issues and processes in sustainability; resource management, waste generation and management; industrial approaches to sustainability; case studies. Credit not granted for both FS 436 and 536. Cooperative: Open to UI degree-seeking students.
- 460 Food Chemistry 3** Course Prerequisite: CHEM 345; MBIOS 303. Fundamentals of food chemistry; composition of foods and the changes that occur during processing. Cooperative: Open to UI degree-seeking students.
- 461 [M] Food Chemistry Laboratory 1 (0-3)** Course Prerequisite: FS 460 or concurrent enrollment. Experiments related to the properties, reactions and interactions of chemical components of foods. Cooperative: Open to UI degree-seeking students.
- 462 Food Analysis 3 (2-3)** Course Prerequisite: CHEM 345; FS 302; FS 303; senior standing. Introductory food analysis; methods common to many food commodities. Recommended preparation: FS 460; FS 461. Cooperative: Open to UI degree-seeking students.
- 464 Food Toxicology 3** Course Prerequisite: MBIOS 303. General principles of toxicological evaluation of chemicals which enter the food chain; toxicology of food additives, colors, preservatives, drugs, pesticides and natural toxins in foods and risk characterization. Credit not granted for both FS 464 and FS 564. Cooperative: Open to UI degree-seeking students.
- 465 Wine Microbiology and Processing 3** Course Prerequisite: MBIOS 303; MBIOS 101 or 305. Technical principles related to the processing and fermentation of wines with an emphasis on microbiology. (Crosslisted course offered as FS 465, VIT ENOL 465). Credit not granted for both FS/VIT ENOL 465 and FS 565. Recommended preparation for graduate students: MBIOS 303; MBIOS 304; MBIOS 101 or 305. Cooperative: Open to UI degree-seeking students.
- 466 Wine Microbiology and Processing Laboratory 1 (0-3)** Course Prerequisite: FS 465 or concurrent enrollment; MBIOS 101 or 304. Hands-on winemaking; application of chemical microbiological methods for wine analysis. Field trip required. (Crosslisted course offered as FS 466, VIT ENOL 466). Cooperative: Open to UI degree-seeking students.
- 470 Advanced Food Technology 3** Course Prerequisite: FS 302; FS 303. Physical principles of food preservation and recent advances in food technology. Credit not granted for both FS 470 and FS 570. Recommended preparation: FS 416; FS 432; FS 460. Cooperative: Open to UI degree-seeking students.
- 475 Statistical Quality Management of Food Products 3** Course Prerequisite: FS 302; FS 303; STAT 212. Apply modern statistical methods for quality control and improvement of biomanufactured goods. This course is designed to expose the student to principles of statistical process control while providing a basis of application in a variety of situations and systems. Cooperative: Open to UI degree-seeking students.
- 489 [CAPS] Food Product Development 3 (1-6)** Course Prerequisite: FS 302; FS 303; FS 416; FS 460; senior standing. Course serves as a capstone experience for food science seniors, and will require the application of food chemistry, food processing/engineering, and microbiology course knowledge in formulating a new food product. Cooperative: Open to UI degree-seeking students.
- 495 Internship in Food Science 2** May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: Sophomore standing. Students work full time in industrial assignments with prior approval of advisor and industrial supervisor. Cooperative: Open to UI degree-seeking students. S, F grading.
- 496 Internship in a Winery 2** May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: Sophomore standing. Industrial assignments at a regional, national or international winery. (Crosslisted course offered as FS 496, VIT ENOL 496). Cooperative: Open to UI degree-seeking students. S, F grading.

- 499 Special Problems V** 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. Cooperative: Open to UI degree-seeking students. S, F grading.
- 501 Topics in Food Science V** 1-3 May be repeated for credit; cumulative maximum 6 hours. Selected topics in food science. Cooperative: Open to UI degree-seeking students.
- 509 Principles of Environmental Toxicology** 3 Nature, properties, effects, and detection of toxic substances in the environment and in environmentally exposed species, including humans. Credit not granted for both FS 409 and 509. Recommended preparation: BIOLOGY 102 or 107; CHEM 102; CHEM 105; CHEM 106; STAT 212. Cooperative: Open to UI degree-seeking students.
- 510 Functional Foods and Health** 3 Benefits of foods beyond basic nutrition; bioactive compounds in functional foods and nutraceuticals relating to disease prevention and health promotion. Recommended preparation: BIOLOGY 101; BIOLOGY 102, or BIOLOGY 106; BIOLOGY 107; MBIOS 303. Cooperative: Open to UI degree-seeking students.
- 511 Food Lipids** 3 Occurrence, structure, chemical and physical properties; functions of lipids in foods. Recommended preparation: FS 460; MBIOS 303. Cooperative: Open to UI degree-seeking students.
- 512 Food Proteins and Enzymes** 2 Chemistry/biochemistry of proteins/enzymes applied to food research and industry; protein functionality/enzyme technology application to food industry. Recommended preparation: FS 460; MBIOS 303. Cooperative: Open to UI degree-seeking students.
- 513 Food Carbohydrates** 3 Structure function relationships of polysaccharides within food systems as a function of their respective molecular structures and physical characteristics. Cooperative: Open to UI degree-seeking students.
- 515 Food Fermentations – Microbiology and Technology** 3 Fundamental understanding of food fermentation science and technology knowledge and principles; application of scientific knowledge to assess and solve food fermentation science and technology problems. Recommended preparation: MBIOS 101 or 305; MBIOS 303. Cooperative: Open to UI degree-seeking students.
- 516 Food Laws** 2 Become familiar with government statutes and regulations that contribute to a safe, nutritious, and wholesome food supply. Understand more about the law and the US legal system relevant to the regulation of the manufacture and sale of food and supplements, including jurisdictional issues, administrative law, and tort, contract, corporate, environmental, labor, and criminal law issues. Cooperative: Open to UI degree-seeking students.
- 517 Scientific Writing** 2 May be repeated for credit. Fundamentals of good technical writing and presentation; preparing and writing thesis/dissertation, scientific publications, and research grants; bibliography organization and citing, statistical data analysis, and preparation of graphics, tables, and posters; reviewing and evaluating current research. Cooperative: Open to UI degree-seeking students.
- 518 Oral Seminar** 1 May be repeated for credit. Development of skills and communication tools and techniques for oral presentations of current food science research. Cooperative: Open to UI degree-seeking students.
- 522 Sensory Evaluation of Food and Wine** 3 Recommended preparation: STAT 212; FS 110 or VIT ENOL 113. Theory, principles and application of sensory evaluation techniques in appearance, aroma, flavor and texture of foods and wine. (Crosslisted course offered as FS 422, VIT ENOL 422). Credit not granted for both FS 422 and FS 522. Cooperative: Open to UI degree-seeking students.
- 529 Dairy Products** 3 Dairy chemistry, microbiology, sanitation, product development and processing from cow to consumer. Credit not granted for both FS 429 and FS 529. Cooperative: Open to UI degree-seeking students.
- 530 Dairy Products Lab** 1 (0-3) Course Prerequisite: Concurrent enrollment in FS 529. Hands-on skills formulating, processing, evaluating and analyzing dairy products using communication and critical thinking skills. Cooperative: Open to UI degree-seeking students.
- 531 Advanced Food Safety and Quality** 3 Analysis of the safety, regulation, protection, and quality of processed food products and their manufacturing environment. Cooperative: Open to UI degree-seeking students.
- 532 Advanced Food Microbiology** 3 Current topics in food-borne pathogens, including novel detection method, virulence and pathogenesis, and their interaction with environment and host. Recommended preparation: BIOLOGY 107, MBIOS 305, or FS 416. Cooperative: Open to UI degree-seeking students.
- 536 Principles of Sustainability** 3 Issues and processes in sustainability; resource management, waste generation and management; industrial approaches to sustainability; case studies. Credit not granted for both FS 436 and 536. Cooperative: Open to UI degree-seeking students.
- 538 Physical Properties of Food** 2 Thermophysical behavior of foods and biopolymers, including water transport/activity, rheological, thermal, dielectric, and barrier properties; Newtonian and non-Newtonian flow; Viscous, viscoelastic, and Hookean behavior; relationship between rheology of food biopolymers and structure, composition, temperature, and plasticizer content. Cooperative: Open to UI degree-seeking students.
- 564 Food Toxicology** 3 General principles of toxicological evaluation of chemicals which enter the food chain; toxicology of food additives, colors, preservatives, drugs, pesticides and natural toxins in foods and risk characterization. Credit not granted for both FS 464 and FS 564. Cooperative: Open to UI degree-seeking students.
- 565 Wine Microbiology and Processing** 3 Technical principles related to the processing and fermentation of wines with an emphasis on microbiology. (Crosslisted course offered as FS 465, VIT ENOL 465). Credit not granted for both FS/VIT ENOL 465 and FS 565. Recommended preparation for graduate students: MBIOS 303; MBIOS 304; MBIOS 101 or 305. Cooperative: Open to UI degree-seeking students.
- 570 Advanced Food Technology** 3 Physical principles of food preservation and recent advances in food technology. Credit not granted for both FS 470 and FS 570. Recommended preparation: FS 416; FS 432; FS 460. Cooperative: Open to UI degree-seeking students.
- 583 Advances in Cereal Sciences and Technology** 2 Chemistry and functionality of cereal grains as related to their processing and product quality. Recommended preparation: MBIOS 303, CHEM 345, or FS 460. Cooperative: Open to UI degree-seeking students.
- 700 Master's Research, Thesis, and/or Examination V** 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 800 Doctoral Research, Dissertation, and/or Examination V** 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Food Science PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Department of Foreign Languages and Cultures

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Professor and Department Chair, J. Hughes; Professors, J. Grenier-Winther (Vancouver), C. Lupke, F. Manzo-Robledo; Associate Professors, W. Brecher, M. Hubert, X. Liu, V. Navarro-Daniels, A. M. Rodriguez-Vivaldi; Assistant Professors, K. Inoue; Clinical Professors, J. Bonzo, W. Cao, R. Chareyron, S. Davis, M. Previto; Instructors, R. Abo, G. Gamez, C. Gulam (Vancouver), M.Y. Kim, J. Klassen, M. Lee-Lopez (Vancouver), S.

Lopez-Lopez, S. Mina-Herrera, D. Nielson, K. Niimi, M. Shaheen, E. Smith, I. Webber; Visiting Instructor, X. Lin; Director, Language and Learning Resource Center, J. Martin; Educational Technology Coordinator, C. Williams; Academic Program Manager, L. Heustis.

To support and enhance the university's stated goal of promoting global leadership, the Department of Foreign Languages and Cultures is in the unique position to provide WSU students with the linguistic proficiency and intercultural competence that will allow them to become true and effective global leaders.

The department offers courses of study leading to the degrees of Bachelor of Arts in Foreign Languages and Cultures (Chinese Language and Culture, French, Japanese, and Spanish), Profession Second Major (Spanish, French, Japanese, and German), and Master of Arts in Foreign Languages and Cultures (Spanish). Language minors are available in Chinese, French, German, Japanese, and Spanish. Language/cultural minors are also possible in Film Studies, French Area Studies, German Area Studies, Global Studies, and Latin American Area Studies. Languages of Arabic, Korean, Russian (Pullman) and elementary Latin (Vancouver) are also offered.

The department also advises in degree areas of General Humanities-International Studies in the major concentration areas of Latin American Area Studies, Germanic Area Studies, French and Francophone Area Studies, and European Area Studies. (See Liberal Arts, General Studies-International Studies.)

In the case of the French and Spanish majors, the program outcomes promote linguistic proficiency and intercultural competence:

1. Linguistic Proficiency: Students can demonstrate an Advanced Low level of proficiency (as defined in ACTFL Proficiency Guidelines) in the target language in speaking, writing, listening and reading.

- Speaking: Students are able to handle a variety of communicative tasks. They are able to participate in most informal and some formal conversations on topics related to school, home, and leisure activities. They can also speak about some topics related to employment, current events, and matters of public and community interest.

- Writing: Students are able to meet basic work and/or academic writing needs. They demonstrate the ability to narrate, describe and express viewpoints about familiar topics in major time frames with some control of aspect.

- Listening and Reading: Students are able to understand short conventional narrative and descriptive texts (spoken and/or written) such as descriptions of persons, places, and things, and narrations about past, present, and future events with a clear underlying structure though their comprehension may be uneven. They can understand the main facts and some supporting details. Comprehension may often derive primarily from situational and subject-matter knowledge.

2. Intercultural Competence: Students will demonstrate knowledge and understanding of other cultures and their products. By the time they graduate from our program, they will be able to:

- Recognize and describe the historical, social, economic, and political forces that shape society in the target culture.

- Analyze and critique the products of the target culture (film, literature, art, popular culture, media,

etc.) within their context, including conducting basic research tasks.

- Examine the validity of one's own cultural beliefs, behaviors and norms by contrasting and comparing them with those of the target culture.

- Perceive and value cultural diversity and reinterpret the place of the self as an identity culturally situated in the global context.

The major in Chinese language and culture provides students with a broad range of skills that enable our graduates to become leaders in fields related to Chinese, the most spoken language in the world. The major includes study of at least four years of Chinese language, at least three courses on Chinese and/or East Asian culture taught in English, and three area studies courses taught in other disciplines, such as philosophy, political science, history, art history, international business, or others. Study abroad in an immersion program in China or Taiwan is strongly recommended. Up to eighteen credits from study abroad may be counted toward the major, depending on the length of the program and the amount of contact hours.

A student who graduates with a Chinese major should be able to speak, understand, read and write Chinese at an advanced level of proficiency. Students should be able to speak with confidence on a broad range of daily topics such as ordering food in a restaurant, going to the bank and the post office, taking various kinds of transportation, and shopping. Students should also be able to express their opinions on a wide variety of subjects such as politics, culture, society, and to talk about themselves, their families, and their backgrounds with Chinese while also asking the same of their Chinese interlocutors. Students should be able to develop relationships with others entirely with the use of Chinese. Students should be able to discuss some topics, such as those related to a second specialization, with sophistication and accuracy, utilizing a broad vocabulary.

Such students should also possess a broad knowledge of Chinese and East Asian society. Students should have some knowledge of important events, phenomena and trends in Chinese history, and they should have an understanding of at least some literary and philosophical texts. They should have a good understanding of China in relation to its neighbors and in the world. They should also have the skills to interpret emerging issues and events related to China. A student who graduates with a major in Chinese, especially if that is combined with a double major in a subject such as international business, engineering, political science, hospitality business management, communication, or another subject, can expect to fare more competitively in the job market or in applying to graduate or professional school than if he or she had not studied Chinese. Chinese is one of the most practical languages to study today, as China's presence in the global marketplace as well as its position with respect to issues of national security and international stability is second only to the United States.

Students who wish to pursue an international career should (1) select a major or minor in a foreign language, (2) select a second major in another professional field, (3) choose courses in the second professional field that focus on international issues, (4) choose University Common Requirements (UCORE) courses that focus on international studies, and (5) spend a semester or more in a study abroad

program, ideally a program that offers an internship in the student's professional field.

Recognizing the need for students to reinforce, in a practical way, knowledge gained in the classroom, the department sponsors a wide variety of supplementary activities. The Chinese House, a living group where only Chinese is spoken and where conversational activities are supervised by a resident native speaker. McCroskey International House promotes cultural awareness and understanding built on personal contact and the exchange of ideas and opinions between people of diverse nations, races and religions. Visiting lecturers, language tables, foreign film showings, and other cultural events supplement the classroom experience.

State-of-the-art technology and multimedia facilities in the classroom and at our Language Learning Resource Center enhance the learning experience.

The Japanese Program offers students a choice between a standard Japanese Language and Culture Major and a Japanese for the Professions Major (additional major only). The Japanese Language and Culture degree option prepares students to enter the teaching profession and/or continue their study of the language at the graduate level. Japanese for the Professions offers a skills-based, proficiency-oriented additional major that prepares students to communicate in Japanese in professional settings. Both majors focus on both language proficiency and intercultural proficiency to provide students entering today's global, diverse workplace with the communication skills necessary to work effectively within and across different language communities, increasing their employability. Study abroad in Japan is highly recommended. Up to eighteen credits from study abroad may be counted toward the major, depending on the length of the program and the number of contact hours.

Students interested in Japan but who do not wish to pursue a major in Japanese can opt to minor in Japanese or major in Asian Studies with an emphasis on Japan. The Japanese minor complements a range of majors and professions and creates greater opportunities to study, work, and travel abroad.

Teacher Training Program

Students preparing to teach should consult the catalog listing of the Department of Teaching and Learning for certification requirements and for teaching majors and minors. Those who intend to major in foreign languages and education should begin the study of the major language in the first year and of the minor language, if any, not later than the beginning of the second year. Students are also required to take FOR LANG 440 and 441. Teacher training is available in the language programs of French, Japanese, and Spanish.

Preparation for Graduate Study

Students who contemplate graduate work in Spanish in the Department of Foreign Languages and Cultures should present an undergraduate degree similar to those described in the schedule of studies of Spanish. Complete details on graduate programs are available from the graduate studies advisor and on the departmental website, <http://forlang.wsu.edu>.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

CHINESE LANGUAGE AND CULTURE (120 HOURS)

A minimum of 34 hours beyond the 203 level (or the equivalent level in competence) in the major language is required for a Bachelor of Arts degree in Foreign Languages and Cultures. CHINESE 101, 102, and 203 do not count toward the major. Students who place into 102 and receive a B or better qualify for an additional 4 departmental advanced placement credits; students placing into 203 or above and receiving a B or better qualify for 8 departmental advanced placement credits. A maximum of 8 departmental AP credits is possible. See department for details.

Majors must complete either a minor in a second foreign language, a concentration of at least 16 credits in a related field, or a second major.

No course in which a C- or lower grade is earned will be counted toward the major or minor. 300-400-level courses taken pass, fail may not be included for credit toward the major. No course may be repeated for credit toward the major unless thus designated in the catalog. No course may count for both the major and the minor.

Majors and prospective majors are strongly encouraged to spend at least one semester abroad, living in the target culture and enhancing their fluency. Many accredited study abroad programs are available; students should work with their advisers in the selection of a program.

Of the 34 hours required for the major, a minimum of 15 must be taken in residence with 6 of these hours at the 400 level. A maximum of 12 credits per semester or 18 credits per year earned in a study abroad program may be applied toward the major. Credits for CHINESE 105, 205, 305, and 405 may not be applied toward the major or minor.

All majors must complete an exit proficiency examination during the semester in which they complete the last language course of their major. There is a fee charged for the exam.

First Year

<i>First Term</i>	<i>Hours</i>
CHINESE 101, 102, 203 or Elective ¹	4
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3
FOR LANG 101, 110, 120, 130, or 220	3
Quantitative Reasoning [QUAN]	3
<i>Second Term</i>	<i>Hours</i>
CHINESE 102, 203 or Elective ¹	4
CHINESE 111, 120, 121, or 131	3
Communication [COMM] or Written Communication [WRTG]	3
HISTORY 105 [ROOT]	3

Second Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ²	4
CHINESE 203 or Elective ¹	4

Social Sciences [SSCI]	3
Electives ³	4
<i>Second Term</i>	<i>Hours</i>
CHINESE 204 or 307	3
CHINESE 311 [M], 320 [M], 321[M], or 330 [M]	3
Humanities [HUM]	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ²	4
Electives ³	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
CHINESE 306, 307, or 308	3
CHINESE 361, 363, 364, or 450	3
Chinese Area Studies Elective ⁴	3
Diversity [DIVR]	3
Elective ³	3
<i>Second Term</i>	<i>Hours</i>
CHINESE 306, 307, or 308	3
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
300-400-level Electives ³	3
Electives ³	6

Fourth Year

<i>First Term</i>	<i>Hours</i>
CHINESE 306, 307, or 308	3
Chinese Area Studies Elective ⁴	3
300-400-level Electives ³	9
<i>Second Term</i>	<i>Hours</i>
CHINESE 361, 363, 364, or 450	3
Chinese Area Studies Elective ⁴	3
Integrative Capstone [CAPS]	3
300-400-level Electives ³	6
Exit Proficiency Exam	

¹ Student must meet proficiency requirement to enroll in CHINESE 204. Study abroad in an immersion program in China or Taiwan is strongly recommended.

² To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

³ Electives must be represented by an approved university minor in a second foreign language; 16 credits in a concentrated related field; or a second major in another field.

⁴ Chinese Area Studies (9 credits): Approved courses include ASIA 302 [M], 314, 315 [M], 476 [M], CES 314 [M], 315 [M], and POL S 333, or as approved by advisor. University requirements include a total of two [M] courses.

FRENCH (120 HOURS)

A minimum of 34 hours beyond the 203 level (or the equivalent level in competence) in the major language is required for a Bachelor of Arts degree in Foreign Languages and Cultures. FRENCH 101, 102, and 203 do not count toward the major.

Students who place into 102 and receive a B or better qualify for an additional 4 departmental advanced placement credits; students placing into 203 or above and receiving a B or better qualify for 8 departmental advanced placement credits. A maximum of 8 departmental AP credits is possible. See department for details.

Majors must complete either a minor in a second foreign language, a concentration of at least 16 credits in a related field, or a second major.

No course in which a C- or lower grade is earned will be counted toward the major or minor. 300-400-level courses taken pass, fail may not be included for credit toward the major. No course may be repeated for credit toward the major unless thus designated in the catalog. No course may count for both the major and the minor.

Majors and prospective majors are strongly encouraged to spend at least one semester abroad, living in the target culture and enhancing their fluency. Many accredited study abroad programs are available; students should work with their advisers in the selection of a program.

Of the 34 hours required for the major, a minimum of 15 must be taken in residence with 6 of these hours at the 400 level. A maximum of 12 credits per semester or 18 credits per year earned in a study abroad program may be applied toward the major. Credits for FRENCH 105, 205, 305, and 405 may not be applied toward the major or minor.

All majors must complete an exit proficiency examination during the semester in which they complete the last language course of their major. There is a fee charged for the exam.

First Year

<i>First Term</i>	<i>Hours</i>
CHINESE, GERMAN, SPANISH 110, 111, 120, 121, 130, or 131	3
FOR LANG 101, 110, 120, 130, or 220	3
FRENCH 101, 102, 203 or Elective ¹	4
FRENCH 105 or elective	1
HISTORY 105 [ROOT]	3

<i>Second Term</i>	<i>Hours</i>
CHINESE, GERMAN, SPANISH 110, 111, 120, 121, 130, or 131	3
ENGLISH 101 [WRTG]	3
FRENCH 102, 203 or Elective ¹	4
FRENCH 105 or elective	1
Quantitative Reasoning [QUAN]	3

Second Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ²	4
FRENCH 203 or Elective ¹	4
FRENCH 205 or elective	1
Social Sciences [SSCI]	3
Electives ³	3

<i>Second Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
FRENCH 110 or 120	3
FRENCH 204	4
FRENCH 205 or elective	1
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ²	4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
Diversity [DIVR]	3
FRENCH 305 or elective	1
FRENCH 306, 307 or 308 [M]	3
FRENCH 310, 320, 350, or 361	3
Humanities [HUM]	3
Electives or FOR LANG 440 if teaching major ³	3

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
FRENCH 305 or elective	1
FRENCH 306, 307 or 308 [M]	3
FRENCH 310, 320, 350, or 361	3
Electives ³	4

Fourth Year

<i>First Term</i>	<i>Hours</i>
FRENCH 310, 320, 350, or 361	3
FRENCH 405 or elective	1
FRENCH 410 [CAPS], 420 [CAPS], 430 [CAPS], or 450 [M] ⁴	3
300-400-level Electives ³	9

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
FRENCH 405 or elective	1
FRENCH 408 [M]	3
FRENCH 410 [CAPS], 420 [CAPS], 430 [CAPS], or 450 [M] ⁴	3
300-400-level Elective, Integrative Capstone [CAPS], or [M] Course ⁴	3
Electives ³	3
Exit Proficiency Exam	

¹ Student must meet proficiency requirement to enroll in FRENCH 204.

² To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

³ Electives must be represented by an approved university minor in a second foreign language; 16 credits in a concentrated related field; or a second major in another field.

⁴ University requirements include one [CAPS] course and two [M] courses.

JAPANESE (120 HOURS)

A minimum of 34 hours beyond the 203 level (or the equivalent level in competence) in the major language is required for a Bachelor of Arts degree in Foreign Languages and Cultures. 101, 102, and 203 do not count toward the major. Students who place into 102 and receive a B or better qualify for an additional 4 departmental advanced placement credits; students placing into 203 or above and receiving a B or better qualify for 8 departmental advanced placement credits. A maximum of 8 departmental AP credits is possible. See department for details.

Majors must complete either a minor in a second foreign language, a concentration of at least 16 credits in a related field, or a second major.

No course in which a C- or lower grade is earned will be counted toward the major or minor. 300-400-level courses taken pass, fail may not be included for credit toward the major. No course may be repeated for credit toward the major unless thus designated in the catalog. No course may count for both the major and the minor.

Majors and prospective majors are strongly encouraged to spend at least one semester abroad, living in the target culture and enhancing their fluency. Many accredited study abroad programs are available; students should work with their advisers in the selection of a program.

Of the 34 hours required for the major, a minimum of 15 must be taken in residence with 6 of these hours at the 400 level. A maximum of 12 credits per semester or 18 credits per year earned in a study abroad program may be applied toward the major. Credits for 105, 205, 305, 405 may not be applied toward the major or minor.

Honors students complete the Honors College requirements which replace the UCORE requirements.

All majors must complete an exit proficiency examination during the semester in which they complete the last language course of their major. There is a fee charged for the exam.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
ENGLISH 101 [WRTG]	3
FOR LANG 101, 110, 120, 130, or 220	3
JAPANESE 101, 102, 203, or Elective ²	4
JAPANESE 105 or Elective	1

<i>Second Term</i>	<i>Hours</i>
HISTORY 105 [ROOT]	3
JAPANESE 102, 203, or Elective ²	4
JAPANESE 111, 120, 123, or 131	3
Quantitative Reasoning [QUAN]	3
Electives ³	3

Second Year

<i>First Term</i>	<i>Hours</i>
JAPANESE 203 or Elective ²	4
JAPANESE 205 or Elective	1
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4
Social Sciences [SSCI]	3
Electives ³	3

<i>Second Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
Creative & Professional Arts [ARTS]	3
Humanities [HUM]	3
JAPANESE 204	4
JAPANESE 205 or Elective	1
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
Area Studies Courses ⁴	3
ASIA 330 [M], CHINESE 311 [M], JAPANESE 320 [M], or JAPANESE 322 [DIVR] ⁵	3
JAPANESE 306, 307, 308, or 361	3
Electives ³	6

<i>Second Term</i>	<i>Hours</i>
ASIA 330 [M], CHINESE 311 [M], JAPANESE 320 [M], or JAPANESE 322 [DIVR] ⁵	3
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
FOR LANG 440 if teaching major or Electives	4
JAPANESE 305 or Elective	1
JAPANESE 306, 307, 308, or 361	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
ASIA 330 [M], CHINESE 311 [M], JAPANESE 320 [M], or JAPANESE 322 [DIVR] ⁵	3
FOR LANG 441 if teaching major or 300-400-level Electives ⁶	3
JAPANESE 305 or Elective	1
JAPANESE 306, 307, 308, or 361	3
Electives ⁶	6

<i>Second Term</i>	<i>Hours</i>
Area Studies Courses ⁴	3
Integrative Capstone [CAPS]	3
Electives ⁶	9
Language Proficiency Exam	

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² Student must meet proficiency requirement to enroll in JAPANESE 204.

³ Electives must be represented by an approved university minor in a second foreign language; 16 credits in a concentrated related field; or a second major in another field.

⁴ Area Studies courses: Students must take 6 credits in Japanese-related courses from CES 313, 314, 315, 411, and 413; ASIA 275, 374, 387, 477, and 479; FINE ART 302; PHIL 314 and 315; or as approved by advisor.

⁵ Students who do not take JAPANESE 322 must take another course to fulfill University Diversity [DIVR] requirement.

⁶ Electives may need to include up to 6 credits of major coursework at the 400-level to meet the major requirement. Approved courses are JAPANESE courses and Area Studies courses, or as approved by advisor. The University requires a minimum of 40 credits of 300-400-level coursework.

SPANISH (120 HOURS)

A minimum of 34 hours beyond the 203 level (or the equivalent level in competence) in the major language is required for a Bachelor of Arts degree in Foreign Languages and Cultures. SPANISH 101, 102, and 203 do not count toward the major. Students who place into 102 and receive a B or better qualify for an additional 4 departmental advanced placement credits; students placing into 203 or above and receiving a B or better qualify for 8 departmental advanced placement credits. A maximum of 8 departmental AP credits is possible. See department for details.

Majors must complete either a minor in a second foreign language, a concentration of at least 16 credits in a related field, or a second major.

No course in which a C- or lower grade is earned will be counted toward the major or minor. 300-400-level courses taken pass, fail may not be included for credit toward the major. No course may be repeated for credit toward the major unless thus designated in the catalog. No course may count for both the major and the minor.

Majors and prospective majors are strongly encouraged to spend at least one semester abroad, living in the target culture and enhancing their fluency. Many accredited study abroad programs are available; students should work with their advisers in the selection of a program.

Of the 34 hours required for the major, a minimum of 15 must be taken in residence with 6 of these hours at the 400 level. A maximum of 12 credits per semester or 18 credits per year earned in a study abroad program may be applied toward the major. Credits for SPANISH 105, 205, 305, and 405 may not be applied toward the major or minor.

All majors must complete an exit proficiency examination during the semester in which they complete the last language course of their major. There is a fee charged for the exam.

First Year

<i>First Term</i>	<i>Hours</i>
ENGLISH 101 [WRTG]	3
FOR LANG 101, 110, 120, 130, or 220	3
MATH 103 (if needed) or Electives ¹	3
SPANISH 101, 102, 203 or Elective ²	4

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
HISTORY 105 [ROOT]	3
Quantitative Reasoning [QUAN]	3
SPANISH 102, 203 or Elective ²	4
SPANISH 105 or Elective	1

Second Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ³	4
Communication [COMM] or Written Communication [WRTG]	3
Social Sciences [SSCI]	3
SPANISH 203 or Elective ²	4
SPANISH 205 or Elective	1
Electives ¹	3

<i>Second Term</i>	<i>Hours</i>
Humanities [HUM]	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ³	4
SPANISH 204	4
SPANISH 205 or Elective	1
Electives ¹	4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
Diversity [DIVR]	3
SPANISH 306	3
SPANISH 307	3
SPANISH Film/Literature/Culture Elective ⁴	3
Electives or FOR LANG 440 if teaching major ¹	3

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
SPANISH 305 or elective	1

SPANISH 308	3
SPANISH Film/Literature/Culture Elective ⁴	3
300-400-level Electives ¹	5

Fourth Year

<i>First Term</i>	<i>Hours</i>
SPANISH 407	3
SPANISH 450 [M], 451 [M], 452 [M], or 453 [M]	3
Electives ¹	9

<i>Second Term</i>	<i>Hours</i>
Integrative Capstone [CAPS]	3
SPANISH 305 or elective	1
SPANISH 408 [M]	3
SPANISH 450 [M], 451 [M], 452 [M], or 453 [M]	3
300-400-level Electives ¹	4
Exit Proficiency Exam	

¹ Electives must be represented by a competence in a second foreign language up to and including 204; an approved university minor or a teaching minor; or a second major in another field.

² Student must meet proficiency requirement to enroll in SPANISH 204.

³ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

⁴ Approved SPANISH Film/Literature/Culture Electives include (two courses): SPANISH 310, 311, 320, 321, 350, 351, 361, 362, 363, 364, 365, or as approved by advisor.

Additional Majors

Additional Major – French for the Professions

Students who are certified in a major may seek an additional major in French for the Professions. This additional major does not lead to a degree. The additional major requires 38 credits, as follows: 1) Language Foundation (14 credits) -- FRENCH 101, 102, 203, and 261. Note that most students entering WSU will have already fulfilled the equivalent of the 101 and 102 courses, if they choose to pursue the same foreign language for this major; 2) Intermediate Language (6 credits) -- Two courses from FRENCH 306, 307, or 308; 3) Language for Specific Purposes (6 credits) -- FRENCH 320 [HUM] and 361 [COMM]; and 4) Upper-level Experience (12 credits) -- FRENCH 420 [CAPS]; two Writing in the Major courses (see department); and FOR LANG 495, Internship / Service Learning / Undergraduate Research / Study Abroad (for 8 weeks minimum). No course in which a C- or lower grade is earned will be counted toward the additional major. No course taken pass/fail may be included for credit toward the major. No course may be repeated for credit toward the major unless thus designated in the catalog. No course may count for both the major and the minor. The STAMP 4S (Standards-based Measurement of Proficiency) web-based assessment of foreign language proficiency in reading, writing, speaking, and listening and will be taken during the semester in which the student is

completing the final course for the major taught in the target language.

Additional Major – German for the Professions

Students who are certified in a major may seek an additional major in German for the Professions. This additional major does not lead to a degree. The additional major requires 39 credits, as follows: 1) Language Foundation (15 credits) -- GERMAN 101, 102, 203, and 204. Note that most students entering WSU will have already fulfilled the equivalent of the 101 and 102 courses, if they choose to pursue the same foreign language for this major; 2) Intermediate Language (6 credits) -- GERMAN 307 and 308; 3) Language for Specific Purposes (6 credits) -- GERMAN 320 and 361 [COMM]; and 4) Upper-level Experience (12 credits) -- GERMAN 420 [CAPS]; two Writing in the Major courses (see department); and FOR LANG 495, Internship / Service Learning / Undergraduate Research / Study Abroad (for 8 weeks minimum). No course in which a C- or lower grade is earned will be counted toward the additional major. No course taken pass/fail may be included for credit toward the major. No course may be repeated for credit toward the major unless thus designated in the catalog. No course may count for both the major and the minor. The STAMP 4S (Standards-based Measurement of Proficiency) web-based assessment of foreign language proficiency in reading, writing, speaking, and listening and will be taken during the semester in which the student is completing the final course for the major taught in the target language.

Additional Major – Japanese for the Professions

Students who are certified in a major may seek an additional major in Japanese for the Professions. This additional major does not lead to a degree. The additional major requires 37 credits, as follows: 1) Language Foundation (16 credits) -- JAPANESE 101, 102, 203, and 204; 2) Intermediate Language (9 credits) -- JAPANESE 306, 307, and 308; 3) Language for Specific Purposes (3 credits) -- JAPANESE 361; 4) Lower-level Culture/Literature course taught in English (3 credits) -- one from JAPANESE 111, 120, 123, and 131; 5) Upper-level Culture/Literature courses taught in English (6 credits) -- two from CHINESE 311, JAPANESE 320, JAPANESE 322, and ASIA 330; and 6) two Writing in the Major courses (see department). No course in which a C- or lower grade is earned will be counted toward the additional major. No course taken pass/fail may be included for credit toward the major. No course may be repeated for credit toward the major unless thus designated in the catalog. No course may count for both the major and the minor. The STAMP 4S (Standards-based Measurement of Proficiency) web-based assessment of foreign language proficiency in reading, writing, speaking, and listening and will be taken during the semester in which the student is completing the final course for the major taught in the target language.

Additional Major – Spanish for the Professions

Students who are certified in a major may seek an additional major in Spanish for the Professions.

This additional major does not lead to a degree. The additional major requires 38 credits, as follows: 1) Language Foundation (14 credits) -- SPANISH 101, 102, 203, and 261. Note that most students entering WSU will have already fulfilled the equivalent of the 101 and 102 courses, if they choose to pursue the same foreign language for this major; 2) Intermediate Language (6 credits) -- Two courses from SPANISH 306, 307, or 308; 3) Language for Specific Purposes (6 credits) -- SPANISH 320 or 321 [DIVR]; and 361, 362, 363, 364, or 365; and 4) Upper-level Experience (12 credits) -- Integrative Capstone [CAPS]; two Writing in the Major courses (see department); and FOR LANG 495, Internship / Service Learning / Undergraduate Research / Study Abroad (for 8 weeks minimum). No course in which a C- or lower grade is earned will be counted toward the additional major. No course taken pass/fail may be included for credit toward the major. No course may be repeated for credit toward the major unless thus designated in the catalog. No course may count for both the major and the minor. The STAMP 4S (Standards-based Measurement of Proficiency) web-based assessment of foreign language proficiency in reading, writing, speaking, and listening and will be taken during the semester in which the student is completing the final course for the major taught in the target language.

Minors

Chinese, French, German, Japanese, or Spanish

To fulfill requirements for a minor in Chinese, French, German, Japanese, or Spanish, a student must complete a minimum of 17 credits of course work in one language area. A foundation of the target language, 203 and 204 (8 credits), is required; in addition, 3 courses (9 credits) must be taken in courses other than 203-204 at the 300-400 level. A minimum of 9 credits with a letter grade must be taken in residence at WSU, of which 3 must be at the 300-400-level. All courses must be passed with a grade of C or better. Only courses thus designated in the Catalog may be repeated for credit toward the minor. Courses counting towards a minor in the language may not be counted towards a major in International Area Studies (i.e., Asian Studies, Latin America Area Studies, German Area Studies, or French and Francophone Area Studies). 105, 205, 305, and 405 may not count towards the minor. For courses taken in Study Abroad Programs or as other transfer credits, please check with your advisor. All Chinese, French, German, Japanese, and Spanish language minors must also complete an exit proficiency examination interview during the semester in which they complete the last language course of their minor. There is a fee charged for the exam.

Film Studies

<http://www.forlang.wsu.edu/filmstudies/>
509-335-4136

Ana M. Rodriguez-Vivaldi, (*Faculty Coordinator*) and L. Heustis (*Advisor*)

The Film Studies Minor introduces students to the critical study of cinema and media studies. It explores how cinema both reflects and influences the facts, ideas, and activities of any given society,

and how film allows us to travel to most places in the world and become familiar with diverse cultures, traditions, and ways of thinking. The film studies minor also teaches students how to discern the cinematic and narrative features that are used in cinematography and how culture can influence them. The study of film encourages critical thinking, respect for cultural diversity, and detailed knowledge of film as a text of facts and ideas.

The minor's program of studies is designed by the student in collaboration with the coordinator and /or the advisor. A minimum of 18 credits is required and must include 9 hours of upper-division work taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. 9 credits must be chosen from COM 471, ENGLISH 150, 339, FOR LANG 110, 410, PHIL 210, and SOC 372 or 373. An additional 9 elective credits geared toward social, cultural, or applied skills are required. Approved courses include CES 222, 338, 358 [M], 379, CHINESE/ASIA/JAPANESE 111, CHINESE 311 [M], COM 210, COMJOUR 360, 390, 466, CRM J/POL S 381, DTC 335, 338, DTC/ENGLISH 336, 354, 355, DTC/AMER ST/ENGLISH 475, ENGLISH 205, 316, 340, 342, ENGLISH/FINE ART 337, FINE ART 333, 363, 380, 381, 385, 434, 435, FRENCH 110, 310, 410, GERMAN 110, 310, HISTORY 400, MUS 162, RUSSIAN 410, SOC 373, SPANISH 110, 111, 310, 311, and WOMEN ST 340. No more than two courses with the same subject (or content, as in cross-listed courses) may be applied towards the minor. All core courses must be taken at WSU. After consultation with the film studies coordinator or advisor, two elective courses may be transferred to the film studies minor from accredited study abroad and other university/college programs. A maximum of 3 internship credits may count towards the minor's electives. Learning Goals:

- To enhance knowledge of the history and practice of film production.
- To analyze the nature, history, and function of film in an interdisciplinary manner that broadens and enhances critical thought.
- To enhance the perception of and respect for the diversity of cultures in this country and around the world as exposed through this medium.
- To enhance technical understanding of how film and related-media work.
- To enhance understanding of the societal and cultural roles and impact of film and other media.
- To enhance media literacy skills.

French Area and Culture Studies

A minimum of 16 credits is required (options in French or Francophone Studies). A foundation of the target language, French 203 (4 credits), is required; in addition, 4 courses (12 credits) of further knowledge must be taken other than 203 as: EITHER one lower level and two upper-level courses in FLC plus one approved course in another department; OR one lower-level and one upper-level course in FLC plus two approved courses in another department. See the department of FL&C for a list of acceptable courses. For special requirements concerning French and Francophone options in the French Area Studies Minor, please see your advisor. A minimum of 9 credits with a letter grade must be taken in residence at WSU at the 300-400 level. All courses must be passed with a grade of C or better. Only courses thus designated in the Catalog may be repeated for credit toward the minor. Courses

counting towards a minor in the language may not be counted towards a major in International Area Studies (i.e., Latin America Area Studies, German Area Studies, French and Francophone Area Studies, or Russian Area Studies). 105, 205, and 305 may not count towards the minor. For courses taken in Study Abroad Programs or as other transfer credits, please check with your advisor.

German Area and Culture Studies

A minimum of 16 credits is required. A foundation of the target language, GERMAN 203 (4 credits), is required; in addition, 4 courses (12 credits) of further knowledge must be taken other than 203 as: EITHER one lower level and two upper-level courses in FLC plus one approved course in another department; OR one lower-level and one upper-level course in FLC plus two approved courses in another department. See the department of FL&C for a list of acceptable courses. A minimum of 9 credits with a letter grade must be taken in residency at WSU at the 300-400 level. All courses must be passed with a grade of C or better. Only courses thus designated in the Catalog may be repeated for credit toward the minor. Courses counting towards a minor in the language may not be counted towards a major in International Area Studies (i.e., Latin America Area Studies, German Area Studies, French and Francophone Area Studies, or Russian Area Studies). 105, 205, and 305 may not count towards the minor. For courses taken in Study Abroad Programs or as other transfer credits, please check with your advisor.

Latin American and Spanish Area Studies

A minimum of 16 credits is required. A foundation of the target language, SPANISH 203 (4 credits), is required; in addition, 4 courses (12 credits) of further knowledge must be taken other than 203 as: EITHER one lower level and two upper-level courses in FLC plus one approved course in another department; OR one lower-level and one upper-level course in FLC plus two approved courses in another department. See the department of FL&C for a list of acceptable courses. A minimum of 9 credits with a letter grade must be taken in residency at WSU at the 300-400 level. All courses must be passed with a grade of C or better. Only courses thus designated in the Catalog may be repeated for credit toward the minor. Courses counting towards a minor in the language may not be counted towards a major in International Area Studies (i.e., Latin America Area Studies, German Area Studies, French and Francophone Area Studies, or Russian Area Studies). 105, 205, and 305 may not count towards the minor. For courses taken in Study Abroad Programs or as other transfer credits, please check with your advisor.

Description of Courses

CHINESE

CHINESE

101 First Semester 4 Fundamentals of speaking, listening, reading, and writing. Not open to native speakers except with permission. Cooperative: Open to UI degree-seeking students.

- 102 Second Semester 4** Prerequisite: CHINESE 101 with a grade of C or better. Continuation of CHINESE 101. Not open to native speakers except with permission. Required preparation must include CHINESE 101 with a grade of C or better or equivalent proficiency. Cooperative: Open to UI degree-seeking students.
- 105 Elementary Conversation 1** May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: CHINESE 101 or concurrent enrollment, or CHINESE 102 or concurrent enrollment. Elementary-level conversation practice in small groups with a native/near-native speaker. Not open to native speakers except with permission. Cooperative: Open to UI degree-seeking students. S, F grading.
- 111 [DIVR] Asian Film 3** Asian film from a cultural perspective. Taught in English. (Crosslisted course offered as CHINESE 111, ASIA 111, JAPANESE 111). Cooperative: Open to UI degree-seeking students.
- 120 Traditional Chinese Culture 3** Cultural development of China from early times through the golden age of Chinese civilization. Taught in English. (Crosslisted course offered as CHINESE 120, ASIA 120, HUMANITY 120).
- 121 Modern Chinese Culture 3** An introduction to the culture of modern China, including Hong Kong and Taiwan. All readings in English. (Crosslisted course offered as CHINESE 121, ASIA 121). Cooperative: Open to UI degree-seeking students.
- 131 [DIVR] Masterpieces of Asian Literature 3** Introduction to Asian literature. Taught in English. (Crosslisted course offered as CHINESE 131, ASIA 131, HUMANITY 131, JAPANESE 131). Cooperative: Open to UI degree-seeking students.
- 180 Special Topics: Study Abroad V 1-6** May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 203 Third Semester 4 (3-2)** Course Prerequisite: CHINESE 102 with a grade of C or better. Further development of speaking, listening, reading, and writing skills. Not open to native speakers except with permission. Cooperative: Open to UI degree-seeking students.
- 204 Fourth Semester 4 (3-2)** Course Prerequisite: CHINESE 203 with a grade of C or better. Continued practice in spoken and written language; selected texts in a cultural context. Not open to native speakers except with permission. Cooperative: Open to UI degree-seeking students.
- 205 Intermediate Conversation I 1** May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: CHINESE 203 or concurrent enrollment, or CHINESE 204 or concurrent enrollment. Intermediate-level conversation practice in small groups with a native/near-native speaker. Not open to native speakers except with permission. S, F grading.
- 261 Chinese for the Professions 3** Course Prerequisite: CHINESE 203 with a grade of C or better. Profession-specific language skills training - healthcare, law enforcement, business - with emphasis on speaking and listening. Not open to native speakers except with permission.
- 280 Special Topics: Study Abroad V 1-6** May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 305 Intermediate Conversation II 1** May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: CHINESE 204 or a 300-level CHINESE course or concurrent enrollment. Conversation practice in small groups. Not open to native speakers except with permission. Cooperative: Open to UI degree-seeking students. S, F grading.
- 306 Intermediate Reading and Translation 3** English-Chinese expressions, development of skills to increase reading speed and fluency. Required preparation must include CHINESE 204 with a grade of C or better or equivalent proficiency. Cooperative: Open to UI degree-seeking students.
- 307 Intermediate Speaking and Listening 3** Early advanced training in speaking, reading and writing on abstract topics in Chinese; continued development of listening comprehension skills. Taught in Chinese. Required preparation must include CHINESE 204 with a grade of C or better or equivalent proficiency. Cooperative: Open to UI degree-seeking students.
- 308 Intermediate Grammar and Writing 3** Writing practice in the language and active review of grammar. Not open to native speakers except with permission. Required preparation must include CHINESE 204 with a grade of C or better or equivalent proficiency. Cooperative: Open to UI degree-seeking students.
- 311 [M] Great Asian Directors 3 (2-3)** Focused study of two prominent Asian film directors. Taught in English.
- 320 [DIVR] [M] Issues in East Asian Ethics 3** Philosophical foundations of ethical thought in East Asia; informed responses to modern ethical dilemmas. Taught in English. (Crosslisted course offered as JAPANESE 320, ASIA 320, CHINESE 320, HUMANITY 320). Cooperative: Open to UI degree-seeking students.
- 321 [M] Gender and Love in East Asian Culture 3** The theme of gender with respect to love, courage, self-sacrifice, and vulnerability in traditional Chinese and Japanese literature and culture. (Crosslisted course offered as CHINESE 321, ASIA 321, JAPANESE 321).
- 322 [DIVR] Ecology in East Asian Cultures 3** Major ecological issues in East Asia through cultural representations, and analysis of their implications to the U.S. (Crosslisted course offered as ASIA 322, CHINESE 322, HUMANITY 322, JAPANESE 322).
- 330 [M] The Art of War 3 (2-2)** The philosophy behind war, military strategy and its consequences and representation in literature and film from East Asia. Taught in English. (Crosslisted course offered as CHINESE 330, ASIA 330). Cooperative: Open to UI degree-seeking students.
- 361 Advanced Chinese for the Professions 3** Course Prerequisite: CHINESE 204 with a grade of C or better. Communication in Chinese in the professional setting; telephone and meeting role play, letter writing, television and discussion of current events. Not open to native speakers except with permission. Cooperative: Open to UI degree-seeking students.
- 363 Introduction to Literary Chinese 3** Course Prerequisite: CHINESE 204 with a grade of C or better. Fundamentals of literary Chinese. Open to native speakers. Cooperative: Open to UI degree-seeking students.
- 364 Media Chinese 3** Course Prerequisite: CHINESE 204 with a grade of C or better. Study of Chinese using newspapers, television news, radio broadcasts, webcasts and other journalistic media. Taught in Chinese. Not open to native speakers except with permission. Cooperative: Open to UI degree-seeking students.
- 380 Special Topics: Study Abroad V 1-6** May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 405 Advanced Conversation 1** May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: CHINESE 305. Advanced-level conversation practice in small groups with a native speaker. Cooperative: Open to UI degree-seeking students. S, F grading.
- 450 Seminar in Chinese Studies - Themes 3** Course Prerequisite: Two CHINESE 300-level courses excluding CHINESE 305. Seminar on important themes in Chinese studies. Taught in Chinese. Cooperative: Open to UI degree-seeking students.
- 480 Special Topics: Study Abroad V 1-6** May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 499 Special Problems V 1-4** May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.

CLASSICS

CLASSICS

- 180 Special Topics: Study Abroad V 1-6** May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 280 Special Topics: Study Abroad V 1-6** May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 380 Special Topics: Study Abroad V 1-6** May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 480 Special Topics: Study Abroad V 1-6** May be repeated for credit; cumulative maximum 6 hours. S, F grading.

FOREIGN LANGUAGES AND CULTURES**FOR LANG**

- 100 Studies in Foreign Languages I V** 1-4 May be repeated for credit; cumulative maximum 8 hours. Languages, topics, or foreign language skills/learning opportunities not covered by other 100-level courses. Cooperative: Open to UI degree-seeking students.
- 101 [DIVR] Introduction to the World of Languages** 3 Taught in English. Explore the nature, history, evolution, acquisition, and use of language with examples from major foreign language groups.
- 102 [HUM] Humanities in the Ancient World** 3 Integrated humanities: literature, philosophy, history, and art of the ancient world. (Crosslisted course offered as HUMANITY 101, FOR LANG 102).
- 110 Introduction to Foreign Film** 3 Taught in English. An introduction to the study of international film; stories, cultures, and cinematic features.
- 120 [DIVR] Introduction to Foreign Cultures** 3 An introduction to inter-/intra-cultural communication of foreign cultures, plus customs, art, music, religion, fashion, food, et al. Taught in English.
- 130 [HUM] Global Literature in Translation** 3 Taught in English. An introduction to the study of international literature; stories, cultures, and literary devices. (Crosslisted course offered as FOR LANG 130, HUMANITY 130).
- 180 Special Topics: Study Abroad** V 1-6 May be repeated for credit; cumulative maximum 6 hours. May be repeated for credit; cumulative maximum 6 credits. S, F grading.
- 200 Studies in Foreign Languages II V** 1-4 May be repeated for credit; cumulative maximum 8 hours. Languages, topics, or foreign language skills/learning opportunities not covered by other 200-level courses. Cooperative: Open to UI degree-seeking students.
- 210 Foreign Film and Lecture Series 1** 1 (0-3) An introduction to foreign films through universal themes and their varied cinematic portrayal. S, F grading.
- 220 [DIVR] Global Issues, Regional Realities** 3 Introduction to the themes and concepts involved in global studies. Taught in English. (Crosslisted course offered as FOR LANG 220, ASIA 220).
- 221 Pre-Study/Internship Abroad Orientation** 1 Taught in English. Orientation and practical information for students preparing to study or intern abroad. S, F grading.
- 280 Special Topics: Study Abroad** V 1-6 May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 300 Studies in Foreign Languages** V 1-4 May be repeated for credit. Languages not currently a part of the curriculum may be offered on demand. Not open to native speakers except with permission. Cooperative: Open to UI degree-seeking students.
- 302 [HUM] [M] Humanities in the Middle Ages and Renaissance** 3 Integrated humanities; exploring great works and themes of the European Middle Ages and Renaissance, including art, architecture, music, philosophy, and literature. (Crosslisted course offered as HUMANITY 302, FOR LANG 302).
- 303 [M] Reason, Romanticism, and Revolution** 3 Integrated humanities; literature, philosophy, music, art, 1700 to World War I; revolutionary changes which led to the 20th century. (Crosslisted course offered as HUMANITY 303, FOR LANG 303).
- 304 [HUM] Humanities in the Modern World** 3 Literature, philosophy, art, architecture, film, music since World War I; major works reflecting influential movements and concerns of the modern world. (Crosslisted course offered as HUMANITY 304, FOR LANG 304).
- 350 [DIVR] Speech, Thought, and Culture** 3 The role of language in social situations and as a reflection of cultural differences. (Crosslisted course offered as ANTH 350, FOR LANG 350).
- 380 Special Topics: Study Abroad** V 1-6 May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 400 Special Topics** 3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: GENED 110 or 111. Interdisciplinary study of foreign languages, literature, or culture.
- 410 [CAPS] Advanced Topics in Global Cinema** 3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: One [HUM]; one [ARTS]; junior standing. Taught in English. Analysis of cinematography and culture in film to reveal how societies respond to contemporary issues in a global context.
- 440 Methods of Teaching Foreign Languages** 3 Course Prerequisite: 204-level foreign language course. Survey of current methodology with emphasis on practical application in the classroom. Credit not granted for both FOR LANG 440 and FOR LANG 540.
- 441 Research and Methods of Technology Enhanced Foreign Language Learning** 3 Taught in English. The use of technology in the foreign language classroom; hands-on experience with equipment and multi-media materials. Credit not granted for both FOR LANG 441 and 541.
- 450 Descriptive Linguistics** 3 Introduction to analysis and description of natural languages; phonological, syntactic, and semantic analysis of data from a variety of languages. (Crosslisted course offered as ANTH 450, FOR LANG 450). Cooperative: Open to UI degree-seeking students.
- 480 Special Topics: Study Abroad** V 1-6 May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 495 Cooperative Education Internship** V 1-6 May be repeated for credit; cumulative maximum 6 hours. Cooperative education internship with academic, business, industry or government units. S, F grading.
- 499 Special Problems** V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 540 Methods of Teaching Foreign Languages** 3 Survey of current methodology with emphasis on practical application in the classroom. Credit not granted for both FOR LANG 440 and FOR LANG 540.
- 541 Research and Methods of Technology Enhanced Foreign Language Learning** 3 Taught in English. The use of technology in the foreign language classroom; hands-on experience with equipment and multi-media materials. Credit not granted for both FOR LANG 441 and 541.
- 560 Seminar in Scholarly Methodology** 2 Bibliography and formal aspects of scholarly writing; general introduction to literary criticism.
- 600 Special Projects or Independent Study** V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.

FRENCH**FRENCH**

- 101 First Semester** 4 Fundamentals of speaking, listening, reading, and writing. Not open to native speakers except with permission. Credit not granted for FRENCH 101/102, and 104.
- 102 Second Semester** 4 Course Prerequisite: FRENCH 101 with a grade of C or better. Continued development of basic skills in speaking, listening, reading, and writing. Not open to native speakers except with permission. Credit not granted for FRENCH 101/102, and 104. Required preparation must include FRENCH 101 with a grade of C or better or equivalent proficiency.
- 104 Intensive French: Foundations of Language and Culture** 4 Intensive first-year French, emphasizing reading, writing, oral expression and comprehension, cultural awareness. Serves as a prerequisite for FRENCH 203. Not open to native speakers except with permission. Credit not granted for FRENCH 101/102 and 104.
- 105 Elementary Conversation** 1 May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: FRENCH 101 or concurrent enrollment, or FRENCH 102 or concurrent enrollment. Elementary-level conversation practice in small groups with a native/near-native speaker. Not open to native speakers except with permission. S, F grading.
- 110 [HUM] French/Francophone Film** 3 French and Francophone Film. Taught in English.

- 120 [HUM] French Culture 3** Cultural history of France from beginnings to present; comparison of French and American cultures. Taught in English.
- 180 Special Topics: Study Abroad V 1-6** May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 203 Third Semester 4 (3-2)** Grammar review and further development of speaking, listening, reading, and writing skills. Not open to native speakers except with permission. Required preparation must include FRENCH 102 with a grade of C or better or equivalent proficiency.
- 204 Fourth Semester 4 (3-2)** Continued practice in spoken and written language; selected texts in a cultural context. Not open to native speakers except with permission. Required preparation must include FRENCH 203 with a grade of C or better or equivalent proficiency.
- 205 Intermediate Conversation I 1** May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: FRENCH 203 or concurrent enrollment, or FRENCH 204 or concurrent enrollment. Intermediate-level conversation practice in small groups with a native/near-native speaker. Not open to native speakers except with permission. S, F grading.
- 261 French for the Professions 3** Course Prerequisite: FRENCH 203 with a grade of C or better. Profession-specific language skills training - healthcare, law enforcement, business - with emphasis on speaking and listening. Not open to native speakers except with permission.
- 280 Special Topics: Study Abroad V 1-6** May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 305 Intermediate Conversation II 1** May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: FRENCH 204, or a 300-level FRENCH course or concurrent enrollment. Conversation practice in small groups with native/near-native speakers. Not open to native speakers except with permission. S, F grading.
- 306 Intermediate Reading and Translation 3** Vocabulary building, contrastive English-French expressions, development of skills to increase reading speed and fluency. Required preparation must include FRENCH 204 with a grade of C or better or equivalent proficiency.
- 307 Intermediate Speaking and Listening 3** May be repeated for credit; cumulative maximum 6 hours. Systematic development of speaking and listening proficiency; emphasis on pronunciation and phonetics. Not open to native speakers except with permission. Required preparation must include FRENCH 204 with a grade of C or better or equivalent proficiency.
- 308 [M] Intermediate Grammar and Writing 3** Writing practice in the language and active review of grammar. Not open to native speakers except with permission. Required preparation must include FRENCH 204 with a grade of C or better or equivalent proficiency.
- 310 French and Francophone Film 3 (2-3)** Course Prerequisite: FRENCH 306, 307, or 308. Taught in French. View and discuss French and Francophone films from the 1930's to present. Cooperative: Open to UI degree-seeking students.
- 320 [HUM] [M] French/Francophone Culture 3** Course Prerequisite: FRENCH 306, 307, or 308. Contemporary French and Francophone culture studied through history, arts, and current events. Taught in French.
- 350 Introduction to French Literature 3** May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: FRENCH 306, 307, or 308. Taught in French. French and Francophone novels, short stories and plays.
- 361 [COMM] Advanced French for the Professions 3** Course Prerequisite: FRENCH 204 with a C or better. Communication in French for professional purposes; telephone and meeting role-plays, letter- and resume-writing, discussions of current events in the Francophone world. Not open to native speakers except with permission.
- 380 Special Topics: Study Abroad V 1-6** May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 405 Advanced Conversation 1** May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: FRENCH 408 or concurrent enrollment. Advanced-level conversation practice in small groups with a native speaker. S, F grading.
- 408 [M] Advanced French 3** Course Prerequisite: FRENCH 308 with a C or better. Systematic development of language skills at the advanced level.
- 410 [CAPS] French Film in Translation 3 (2-2)** Course Prerequisite: Junior standing. In depth study of French cinema integrating its history, techniques, methods, and global impact. Taught in English. French majors will complete academic work requirements in the target language. Cooperative: Open to UI degree-seeking students.
- 420 [CAPS] French Culture Through Wine 3** Course Prerequisite: Junior standing. French societal and cultural heritage through the geography, history, production, legislation, and consumption of wine. Taught in English.
- 430 [CAPS] Topics in French/Francophone Literature in Translation 3** Course Prerequisite: Junior standing. Taught in English. In-depth reading and discussion of a select group of French literary works of a particular theme, genre, or author.
- 450 [M] Seminar in French Studies - Themes 3** May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Two 300-level FRENCH courses, excluding FRENCH 305. Seminar on important themes in French studies. Taught in French.
- 480 Special Topics: Study Abroad V 1-6** May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 499 Special Problems V 1-4** May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.

GERMAN

GERMAN

101 First Semester 4 Fundamentals of speaking, listening, reading, and writing. Not open to native speakers except with permission.

102 Second Semester 4 Course Prerequisite: GERMAN 101 with a grade of C or better. Continued development of basic skills in speaking, listening, reading, and writing. Not open to native speakers except with permission. Required preparation must include GERMAN 101 with a grade of C or better or equivalent proficiency.

105 Elementary Conversation 1 May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: GERMAN 101 or concurrent enrollment, or GERMAN 102 or concurrent enrollment. Elementary-level conversation practice in small groups with a native/near-native speaker. Not open to native speakers except with permission. S, F grading.

110 German Film 3 Taught in English. Introduction to German film.

120 [HUM] Germanic Culture 3 Taught in English. The cultural development of the Germanic peoples to 1990.

180 Special Topics: Study Abroad V 1-6 May be repeated for credit; cumulative maximum 6 hours. S, F grading.

203 Third Semester 4 (3-2) Further development of speaking, listening, reading, and writing skills. Not open to native speakers except with permission. Required preparation must include GERMAN 102 with a grade of C or better or equivalent proficiency.

204 Fourth Semester 4 (3-2) Continued practice in spoken and written language; selected texts in a cultural context. Not open to native speakers except with permission. Required preparation must include GERMAN 203 with a grade of C or better or equivalent proficiency.

205 Intermediate Conversation I 1 May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: GERMAN 203 or concurrent enrollment, or GERMAN 204 or concurrent enrollment. Intermediate-level conversation practice in small groups with a native/near-native speaker. Not open to native speakers except with permission. S, F grading.

280 Special Topics: Study Abroad V 1-6 May be repeated for credit; cumulative maximum 6 hours. S, F grading.

- 305 Intermediate Conversation II** 1 May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: GERMAN 204; or a 300-level GERMAN course or concurrent enrollment. Conversation practice in small groups with native/near-native speakers. Not open to native speakers except with permission. S, F grading.
- 307 Intermediate Speaking and Listening** 3 Systematic development of speaking and listening proficiency; emphasis on pronunciation and phonetics. Not open to native speakers except with permission. Required preparation must include GERMAN 204 with a grade of C or better or equivalent proficiency.
- 308 [M] Intermediate Grammar and Writing** 3 Writing practice in the language and active review of grammar. Not open to native speakers except with permission. Required preparation must include GERMAN 204 with a grade of C or better or equivalent proficiency. Cooperative: Open to UI degree-seeking students.
- 310 German Film** 3 Course Prerequisite: GERMAN 307 or GERMAN 308. Study of important German films. Taught in German.
- 320 [HUM] German Culture** 3 Course Prerequisite: GERMAN 307 or GERMAN 308. Introduction to German culture. Taught in German. Cooperative: Open to UI degree-seeking students.
- 350 Introduction to German Literature** 3 Course Prerequisite: GERMAN 307 or GERMAN 308. Survey of masterpieces of German literature. Taught in German.
- 361 [COMM] German for the Professions** 3 Course Prerequisites: GERMAN 204 with a C or better. Language and intercultural skills necessary for effective oral and written communication in professional settings in German-speaking countries. Taught in German.
- 380 Special Topics: Study Abroad** V 1-6 May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 408 [M] Advanced Grammar and Writing** 3 Course Prerequisite: GERMAN 308 with a grade of C or better. Development of advanced proficiency in writing.
- 420 [CAPS] Socio-Cultural History of the German Language** 3 Course Prerequisite: Junior standing. Historical survey of the German language, observing domestic and foreign societal influences, considering present and future language directions.
- 450 [M] Seminar in German Studies - Themes** 3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Two GERMAN 300-level courses excluding GERMAN 305. Seminar on important themes in German studies. Taught in German. Cooperative: Open to UI degree-seeking students.
- 451 [M] Seminar in German Studies - Authors** 3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Two GERMAN 300-level courses excluding GERMAN 305. Seminar on important authors in German studies. Taught in German. Cooperative: Open to UI degree-seeking students.
- 452 [M] Seminar in German Studies - Genres** 3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Two GERMAN 300-level courses excluding GERMAN 305. Seminar on important genres in German studies. Taught in German.
- 480 Special Topics: Study Abroad** V 1-6 May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 499 Special Problems** V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- JAPANESE**
- JAPANESE**
- 101 First Semester** 4 Fundamentals of speaking, listening, reading, and writing. Not open to native speakers except with permission.
- 102 Second Semester** 4 Course Prerequisite: JAPANESE 101 with a grade of C or better. Continued development of basic skills in speaking, listening, reading, and writing. Not open to native speakers except with permission. Required preparation must include JAPANESE 101 with a grade of C or better or equivalent proficiency.
- 105 Elementary Conversation 1** 1 May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: JAPANESE 101 or concurrent enrollment, or JAPANESE 102 or concurrent enrollment. Elementary-level conversation practice in small groups with a native/near-native speaker. Not open to native speakers except with permission. S, F grading.
- 111 [DIVR] Asian Film** 3 Asian film from a cultural perspective. Taught in English. (Crosslisted course offered as CHINESE 111, ASIA 111, JAPANESE 111). Cooperative: Open to UI degree-seeking students.
- 120 [DIVR] Traditional Japanese Culture** 3 Traditional Japanese society and culture from ancient times to the 19th century. Taught in English. (Crosslisted course offered as JAPANESE 120, ASIA 122).
- 123 [HUM] Modern Japanese Culture** 3 Issues, trends, and forms of popular culture that define modern and contemporary Japanese life. Taught in English. (Crosslisted course offered as JAPANESE 123, ASIA 123).
- 131 [DIVR] Masterpieces of Asian Literature** 3 Introduction to Asian literature. Taught in English. (Crosslisted course offered as CHINESE 131, ASIA 131, HUMANITY 131, JAPANESE 131). Cooperative: Open to UI degree-seeking students.
- 180 Special Topics: Study Abroad** V 1-6 May be repeated for credit; cumulative maximum 6 hours.
- 203 Third Semester** 4 (3-2) Course Prerequisite: JAPANESE 102 with a grade of C or better. Further development of speaking, listening, reading, and writing. Not open to native speakers except with permission. Cooperative: Open to UI degree-seeking students.
- 204 Fourth Semester** 4 (3-2) Course Prerequisite: JAPANESE 203 with a grade of C or better. Continued practice in spoken and written language; selected texts in a cultural context. Not open to native speakers except with permission. Cooperative: Open to UI degree-seeking students.

- 205 Intermediate Conversation I** 1 May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: JAPANESE 203 or concurrent enrollment, or JAPANESE 204 or concurrent enrollment. Intermediate-level conversation practice in small groups with a native/near-native speaker; not open to native speakers except with permission. S, F grading.
- 280 Special Topics: Study Abroad V** 1-6 May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 305 Intermediate Conversation II** 1 May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: JAPANESE 204, or a 300-level JAPANESE course or concurrent enrollment. Conversation practice in small groups with native/near-native speakers. Not open to native speakers except with permission. S, F grading.
- 306 Intermediate Reading and Translation** 3 Vocabulary building, contrastive English-Japanese expressions, development of skills of increase reading speed and fluency. Not open to native speakers except with permission. Required preparation must include JAPANESE 204 with a grade of C or better or equivalent proficiency.
- 307 Intermediate Speaking and Listening** 3 Systematic development of speaking and listening proficiency; emphasis on pronunciation and phonetics. Not open to native speakers except with permission. Required preparation must include JAPANESE 204 with a grade of C or better or equivalent proficiency.
- 308 Intermediate Grammar and Writing** 3 Writing practice in the language and active review of grammar. Not open to native speakers except with permission. Required preparation must include JAPANESE 204 with a grade of C or better or equivalent proficiency.
- 320 [DIVR] [M] Issues in East Asian Ethics** 3 Philosophical foundations of ethical thought in East Asia; informed responses to modern ethical dilemmas. Taught in English. (Crosslisted course offered as JAPANESE 320, ASIA 320, CHINESE 320, HUMANITY 320). Cooperative: Open to UI degree-seeking students.
- 321 [M] Gender and Love in East Asian Culture** 3 The theme of gender with respect to love, courage, self-sacrifice, and vulnerability in traditional Chinese and Japanese literature and culture. (Crosslisted course offered as CHINESE 321, ASIA 321, JAPANESE 321).
- 322 [DIVR] Ecology in East Asian Cultures** 3 Major ecological issues in East Asia through cultural representations, and analysis of their implications to the U.S. (Crosslisted course offered as ASIA 322, CHINESE 322, HUMANITY 322, JAPANESE 322).
- 361 Advanced Japanese for the Professions** 3 Course Prerequisite: JAPANESE 204. Communication in Japanese for professional purposes, including letter/e-mail writing, telephoning, interpreting, role-playing, and negotiating in the Japanese business world.
- 380 Special Topics: Study Abroad V** 1-6 May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 480 Special Topics: Study Abroad V** 1-6 May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 499 Special Problems V** 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- LATIN**
- LATIN**
- 101 First Semester Latin** 4 Latin fundamentals of speaking, listening, reading and writing skills.
- 102 Second Semester Latin** 4 Continued development of Latin speaking, listening, reading and writing skills. Required preparation must include LATIN 101 with a grade of C or better or equivalent proficiency.
- 103 Latin Grammar Tutorial** 1 Course Prerequisite: Concurrent enrollment in LATIN 101 or 102. Student-centered, instructor-facilitated grammar tutorial and review session focusing on material presented in LATIN 101 and 102. S, F grading.
- RUSSIAN**
- RUSSIAN**
- 101 First Semester** 4 Fundamentals of speaking, reading, and writing. Not open to native speakers except with permission. Cooperative: Open to UI degree-seeking students.
- 102 Second Semester** 4 Course Prerequisite: RUSSIAN 101 with a grade of C or better. Continued development of basic skills in speaking, reading, and writing. Not open to native speakers except with permission. Required preparation must include RUSSIAN 101 with a grade of C or better or equivalent proficiency. Cooperative: Open to UI degree-seeking students.
- 105 Elementary Conversation** 1 May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: RUSSIAN 101 or concurrent enrollment, or RUSSIAN 102 or concurrent enrollment. Elementary-level conversation practice in small groups with a native/near-native speaker. Not open to native speakers except with permission. Cooperative: Open to UI degree-seeking students. S, F grading.
- 180 Special Topics: Study Abroad V** 1-6 May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 203 Third Semester** 4 (3-2) Further development of speaking, listening, reading, and writing skills. Not open to native speakers except with permission. Required preparation must include RUSSIAN 102 with a grade of C or better or equivalent proficiency. Cooperative: Open to UI degree-seeking students.
- 204 Fourth Semester** 4 (3-3) Continued practice in spoken and written language; selected texts in a cultural context. Not open to native speakers except with permission. Required preparation must include RUSSIAN 203 with a grade of C or better or equivalent proficiency. Cooperative: Open to UI degree-seeking students.
- 205 Intermediate Conversation I** 1 May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: RUSSIAN 203 or concurrent enrollment, or RUSSIAN 204 or concurrent enrollment. Intermediate-level conversation practice in small groups with a native/near-native speaker. Not open to native speakers except with permission. Cooperative: Open to UI degree-seeking students. S, F grading.
- 261 Russian for the Professions** 3 Course Prerequisite: RUSSIAN 203 with a grade of C or better. Profession-specific language skills training - healthcare, law enforcement, business - with emphasis on speaking and listening. Not open to native speakers except with permission.
- 280 Special Topics: Study Abroad V** 1-6 May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 305 Intermediate Conversation II** 1 May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: RUSSIAN 204 or a 300-level RUSSIAN course or concurrent enrollment. Conversation practice in small groups. Not open to native speakers except with permission. Cooperative: Open to UI degree-seeking students. S, F grading.
- 321 Contemporary Russian Culture** 3 Taught in English. Current cultural and social trends in the former USSR. Cooperative: Open to UI degree-seeking students.
- 361 Advanced Russian for the Professions** 3 Course Prerequisite: RUSSIAN 204 with a grade of C or better. Communication in Russian for professional purposes; telephone and meeting role-plays; letter and resume writing; discussions of current events in the Russian-speaking world. Not open to native speakers except with permission. Cooperative: Open to UI degree-seeking students.
- 380 Special Topics: Study Abroad V** 1-6 May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 410 Russian Film** 3 Course Prerequisite: Junior standing. Russian daily life, historical events, and values in representative samples of Russian film. Taught in English. Cooperative: Open to UI degree-seeking students.
- 430 St. Petersburg** 3 Course Prerequisite: Junior standing. Taught in English. The image and role of St. Petersburg in Russian classics in literature, art, music, and film. Cooperative: Open to UI degree-seeking students.
- 462 History of Imperial Russia** 3 History and culture of Imperial Russia from Peter the Great to the 1905 revolution. (Crosslisted course offered as HISTORY 462, RUSSIAN 462).

- 463 [M] History of the Soviet Union 3** The Russian revolutions and the Soviet regime: 1905 to the present. (Crosslisted course offered as HISTORY 463, RUSSIAN 463).
- 480 Special Topics: Study Abroad V 1-6** May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 499 Special Problems V 1-4** May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- SPANISH**
- SPANISH**
- 101 First Semester 4** Fundamentals of speaking, listening, reading, and writing. Not open to native speakers except with permission.
- 102 Second Semester 4** Course Prerequisite: SPANISH 101 with a grade of C or better. Continued development of basic skills in speaking, listening, reading, and writing. Not open to native speakers except with permission. Required preparation must include SPANISH 101 with a grade of C or better or equivalent proficiency.
- 105 Elementary Conversation 1** May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: SPANISH 101 or concurrent enrollment, or SPANISH 102 or concurrent enrollment. Elementary-level conversation practice in small groups with a native/near-native speaker. Not open to native speakers except with permission. S, F grading.
- 110 [ARTS] Peninsular Spanish Film 3** Introduction to Spanish film. Taught in English.
- 111 [ARTS] Latin American Film 3** History of Latin American cinema from a cultural perspective. Taught in English.
- 120 [HUM] Peninsular Spanish Culture 3** Introduction to Spanish culture. Taught in English.
- 121 [HUM] Latin American Culture 3** Contemporary social, political, and cultural issues in Latin America. Taught in English.
- 180 Special Topics: Study Abroad V 1-6** May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 203 Third Semester 4 (3-2)** Further development of speaking, listening, reading, and writing skills. Not open to native speakers except with permission. Required preparation must include SPANISH 102 with a grade of C or better or equivalent proficiency.
- 204 Fourth Semester 4 (3-2)** Continued practice in spoken and written language; selected texts in a cultural context. Not open to native speakers except with permission. Required preparation must include SPANISH 203 with a grade of C or better or equivalent proficiency.
- 205 Intermediate Conversation I 1** May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: SPANISH 203 or concurrent enrollment, or SPANISH 204 or concurrent enrollment. Intermediate-level conversation practice in small groups with a native/near-native speaker. Not open to native speakers except with permission. S, F grading.
- 261 Spanish for the Professions 3** Course Prerequisite: SPANISH 203 with a C or better. Profession-specific language skills training - healthcare, law enforcement, business - with emphasis on speaking and listening. Not open to native speakers except with permission.
- 280 Special Topics: Study Abroad V 1-6** May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 305 Intermediate Conversation II 1** May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: SPANISH 204 or a 300-level SPANISH course or concurrent enrollment. Conversation practice in small groups with native/near native speakers. Not open to native speakers except with permission. S, F grading.
- 306 Intermediate Reading and Translation 3** Vocabulary building, contrastive English-Spanish expressions, development of skills to increase reading speed and fluency. Required preparation must include SPANISH 204 with a grade of C or better or equivalent proficiency.
- 307 Intermediate Speaking and Listening 3** Systematic development of speaking and listening proficiency; emphasis on pronunciation and phonetics. Not open to native speakers except with permission. Required preparation must include SPANISH 204 with a grade of C or better or equivalent proficiency.
- 308 Intermediate Grammar and Writing 3** Writing practice in the language and active review of grammar. Not open to native speakers except with permission. Required preparation must include SPANISH 204 with a grade of C or better or equivalent proficiency.
- 310 Peninsular Spanish Film 3** Course Prerequisite: SPANISH 306, 307, or 308. Study of important Spanish films. Taught in Spanish.
- 311 Latin American Film 3** Course Prerequisite: SPANISH 306, 307, or 308. Variable content seminar that focuses on the study of culture through films; taught in Spanish.
- 320 Peninsular Spanish Culture 3** Course Prerequisite: SPANISH 306, 307, or 308. Study of the culture of Spain. Taught in Spanish.
- 321 [DIVR] Latin American Cultures 3** Course Prerequisite: SPANISH 306, 307, or 308. Study of Latin American culture. Taught in Spanish.
- 350 Introduction to Peninsular Spanish Literature 3** Course Prerequisite: SPANISH 306, 307, or 308. Introduction of literary analysis and the history of literature in Spain.
- 351 Introduction to Latin American Literature 3** Course Prerequisite: SPANISH 306, 307, or 308. Introduction to literary analysis and the history of literature in Latin America. Taught in Spanish.
- 361 Spanish for the Business Professions 3** Course Prerequisite: Spanish 204 with a grade of C or better. Specialized language training for business professionals including basic concepts and economies of Hispanic countries. Not open to native speakers except with permission.
- 362 Spanish for Health Professions 3** Course Prerequisite: Spanish 204 with a grade of C or better. Specialized language training for health professionals focusing on the main systems of human anatomy. Not open to native speakers except with permission.
- 363 Spanish for Law Enforcement 3** Course Prerequisite: Spanish 204 with a grade of C or better. Specialized Spanish language training in the law enforcement profession. Not open to native speakers except with permission.
- 364 Spanish for Veterinarians 3** Course Prerequisite: Spanish 204 with a grade of C or better. Spanish language and culture for veterinary professionals; client-veterinarian situations with specialized terms considering cultural aspects. Not open to native speakers except with permission.
- 365 Spanish for Translation and Interpretation Professions 3** Course Prerequisite: Spanish 204 with a grade of C or better. Specialized Spanish language training in written translation; spoken interpretation techniques to facilitate high quality cross-cultural communication. Not open to native speakers except with permission.
- 380 Special Topics: Study Abroad V 1-6** May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 405 Advanced Conversation 1** May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: Spanish 408 or Spanish 407 or concurrent enrollment. Advanced-level conversation practice in small groups with a native speaker. S, F grading.
- 407 Advanced Speaking and Listening 3** Course Prerequisite: Spanish 307 with a grade of C or better. Systematic development of speaking and listening proficiency at the advanced level.
- 408 [M] Advanced Grammar and Writing 3** Course Prerequisite: Spanish 308 with a grade of C or better. Development of advanced proficiency in writing.
- 420 [CAPS] [M] Cultural Topics 3** Course Prerequisite: Junior standing. Variable content on Peninsular and/or Latin American cultural topics, including US Latino Societies. Taught in English.
- 430 Masterpieces in Spanish Literature 3** Course Prerequisite: Junior standing. Taught in English. Variable topic seminar on Spanish literature.

- 450 [M] Seminar in Spanish Studies - Themes** 3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Two SPANISH 300-level courses excluding SPANISH 305. Seminar on important themes in Spanish studies. Taught in Spanish.
- 451 [M] Seminar in Spanish Studies - Authors** 3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Two SPANISH 300-level courses excluding SPANISH 305. Seminar on important authors in Spanish studies. Taught in Spanish.
- 452 [M] Seminar in Spanish Studies - Genres** 3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Two SPANISH 300-level courses excluding SPANISH 305. Seminar on important genres in Spanish studies. Taught in Spanish.
- 453 [M] Seminar in Spanish Studies: Linguistics** 3 Course Prerequisite: Two SPANISH 300-level courses excluding SPANISH 305. The nature of Spanish language, history, dialects, phonetics, morphology, syntax, semantics, pragmatics, bilingualism and phonology.
- 480 Special Topics: Study Abroad** V 1-6 May be repeated for credit; cumulative maximum 6 hours. S, F grading.
- 499 Special Problems** V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 550 Medieval Literature** 3 Selected works. Taught in Spanish.
- 551 Seminar in Golden Age Literature** 3 Reading and discussion of representative works of the Spanish Golden Age. Taught in Spanish.
- 552 Topics in Nineteenth-Century Spanish Literature** 3 May be repeated for credit; cumulative maximum 6 hours. Selected works and topics. Taught in Spanish.
- 553 Topics in Twentieth-Century Spanish Literature** 3 May be repeated for credit; cumulative maximum 6 hours. Selected works and topics. Taught in Spanish.
- 554 Seminar in Spanish Literature and/or Culture** V 1-3 May be repeated for credit.
- 555 Seminar in Colonial Spanish American Literature** 3 May be repeated for credit; cumulative maximum 6 hours. Seminar on conquest and colonial literature in Hispanic America.
- 556 Seminar in Nineteenth-Century Spanish American Literature** 3 May be repeated for credit; cumulative maximum 6 hours. Study of nineteenth-century Spanish American Literature.
- 557 Seminar in Twentieth-Century Spanish American Literature** 3 May be repeated for credit; cumulative maximum 6 hours. Study of twentieth-century Spanish American literature and culture.
- 558 Seminar in Spanish American Literature and/or Culture** V 1-3 May be repeated for credit.
- 559 Special Topics in Hispanic Studies and/or Linguistics** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Special interdisciplinary topics in Hispanic studies and/or linguistics.
- 560 Beginning Instructional Practicum** 2 May be repeated for credit; cumulative maximum 4 hours. An introduction to foreign language instruction for beginning teaching assistants.
- 561 Advanced Instructional Practicum** 1 May be repeated for credit; cumulative maximum 4 hours. Supervised practical experience in foreign language teaching. S, F grading.
- 597 Graduate Internship** V 1 (0-3) to 6 (0-18) May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: SPANISH 560; FOR LANG 540; minimum GPA of 3.50. Supervised internship experience relating to career objectives; portfolio assignment required. S, F grading.
- 600 Special Projects or Independent Study** V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination** V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 702 Master's Special Problems, Directed Study, and/or Examination** V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

Program in General Studies

Complete information is presented below under General Studies — Liberal Arts and General Studies — Sciences.

Description of Courses

GENERAL STUDIES

GENST

400 General Studies Portfolio 1 Course Prerequisite: By interview only. Evaluating one's educational experience and presenting that evaluation in written form. S, F grading.

General Studies — Liberal Arts

libarts.wsu.edu/genstudies/
Daggy 201
509-335-8731

Director, A. M. Rodriguez-Vivaldi; Associate Director, T. Whitacre.

General Studies is for students who have varied interests that may cut across the usual departmental boundaries and who wish to play a role in deciding on a suitable curriculum of study.

The degrees offered are the Bachelor of Arts in Humanities and Bachelor of Arts in Social Sciences. These degrees are not identified with a specific subject-matter field on the diploma.

Student Learning Outcomes

For each of the tracks within Liberal Arts General Studies, a limited number of particular learning outcomes relate to each respective track. These learning goals specify knowledge and skill appropriate to the title of the degree. For example: the BA in Social Science, and the various BA in Humanities options including International Area Studies, Linguistics, and Religious Studies.

In addition, the student's University experience in terms of assignments, course selection, classroom participation, internships, performances, community services, and service learning activities are considered, and outcomes are measured in terms of society and self; critical thinking and creativity; writing, listening and speaking skills; information literacy; quantitative and symbolic reasoning skills; and depth, breadth and application of knowledge.

In summary, upon completion of a General Studies program, students will be able to:

- Integrate learned skills and knowledge using multi-disciplinary perspectives from their concentrations or areas of study, demonstrating depth or breadth.
- Demonstrate proficiency in using disciplinary-appropriate methods for research or critical analysis or for creative work.
- Communicate conclusions, interpretations, and implications clearly, concisely, and effectively, both orally and in writing for different types of audiences.
- Articulate and apply values, principles, and ideals derived from an individual as well as integrated understanding of their areas of study that demonstrate awareness of current societal / global challenges.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

GENERAL STUDIES - INTERNATIONAL STUDIES (120 HOURS)

Rachel Halverson, Coordinator

The International Area Studies area of General Studies is for students who have interests that are both international and interdisciplinary. Students may choose between these major concentrations:

Latin America Area Studies, German Area Studies, French and Francophone Area Studies, and European Area Studies. (Please note that Asian Area Studies, David Pietz, Coordinator, is described in the Asian Program section of the catalog). Students who wish to earn a Bachelor of Arts in Humanities with a focus in International Area Studies will devise an approved, coherent program of study with the coordinator and a designated advisor who is a specialist in the student's area of interest. The program of study must fulfill an academic or career goal, include prerequisites consistent with the 300-400-level major coursework, satisfy the UCORE requirements and any additional requirements for the College of Arts and Sciences, and include language proficiency appropriate to the cultural area. The area studies major will consist of a minimum of 40 credits. No course in which C- or lower is earned will be counted toward the major. More details are available on the websites of WSU, the General Studies program, and the Foreign Languages Department, at www.forlang.wsu.edu.

GENERAL STUDIES - LINGUISTICS (120 HOURS)

L. Gordon, Coordinator

A student majoring in linguistics may expect a broad liberal education in literature, anthropology, mathematics, and philosophy around a core of language. The student will gain a substantial familiarity with several languages and types of linguistic structure and will become conversant with formal theories of linguistic analysis. Students who major in linguistics will earn a Bachelor of Arts in Humanities degree.

The major in linguistics requires 40 credit hours, variously distributed in the following sequence, depending upon the special emphasis which the student and advisor together select.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
ENGLISH 101 [WRTG]	3
Humanities [HUM]	3
Quantitative Reasoning [QUAN]	3
Electives	3
<i>Second Term</i>	
Communication [COMM] or Written Communication [WRTG]	3
HISTORY 105 [ROOT]	3
Linguistics Elective ²	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4

Second Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
Linguistics Elective ²	3
MATH, CPT S, or STAT Elective ³	3
Social Sciences [SSCI]	3
Foreign Language, if necessary, or Elective	3 or 4
<i>Second Term</i>	
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
Linguistics Electives ²	6

PHIL Elective³ 3
 Foreign Language, if necessary, or Elective 3 or 4
 Complete Writing Portfolio

Third Year

<i>First Term</i>	<i>Hours</i>
Linguistics Elective ²	3
300-level FOR LANG Elective ³	3
Electives	6
Emphasis Elective ³	3
<i>Second Term</i>	
[M] Course	3
Diversity [DIVR]	3
ENGLISH 443 OR 444	3
300-level FOR LANG Elective Elective ³	3
Emphasis Elective ³	4

Fourth Year

<i>First Term</i>	<i>Hours</i>
[M] Course	3
ENGLISH 443 OR 444	3
300-400-level Electives	9
<i>Second Term</i>	
Integrative Capstone [CAPS]	3
300-400-level Electives	12

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² Linguistics Electives: 15 hours or more to be selected from ANTH 350, 450, 499, ENGLISH 255, 256, 454, 456, 457, 458, 499, FOR LANG 101.

³ 19 credits required. Coursework must include a minimum of 3 credits in MATH, CPT S, or STAT; 3 credits in PHIL; and 6 credits in Foreign Language. Remaining courses should be taken in an area of emphasis and chosen in consultation with an advisor to include sufficient upper division coursework work to meet the University requirements. Approved courses include CPT S 111, 121, 401, 440, 443, ENGLISH 546, any 300-400-level FOR LANG course, MATH 106 and 108, 140, 151, 171, 172, 182, 202, 206, 273, 283, MATH/STAT 205, 212, 360, 443; PHIL 201, 401, 443, 499; PSYCH 490, 492, SHS 371, TCH LRN 333, and TCH LRN 414.

GENERAL STUDIES - RELIGIOUS STUDIES (120 HOURS)

M. W. Myers, Coordinator

Religious Studies is a cross-disciplinary program designed for students who wish to develop an understanding of the nature of religion and its role in individual and social life. The program enables students to analyze critically and evaluate western and non-western religions without a predisposition to defend or reject the claims of any particular faith. The program offers both a major and a minor; it is preparatory for careers and future study in international affairs, arts, humanities, social sciences, and intercultural studies. Students who major in religious studies will earn a Bachelor of Arts in Humanities degree.

A student may earn a major in Religious Studies by completing 39 semester hours of work from among the designated courses in the several departments involved. Of these 39 hours, 12 must consist of the core courses specified below for all majors. Further courses are specified as required or elective depending on the student's focus: western religions, non-western religions, or comparative religions. There is also a language requirement.

A student must also satisfy the UCORE and College of Arts and Sciences graduation requirements and take at least 40 of the total 120 semester hours in 300-400-level courses. For a minor in Religious Studies, a student must take at least 18 semester hours of work, including the core (minus the Seminar in Religious Studies) and three courses from the required list of comparative religion. Religious Studies also makes an ideal second major.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
ENGLISH 101 [WRTG]	3
Foreign Language ²	4
Quantitative Reasoning [QUAN]	3

Second Term *Hours*

Communication [COMM] or Written Communication [WRTG]	3
Foreign Language ²	4
HISTORY 105 [ROOT]	3
HUM 103 [HUM]	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4

Second Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
Foreign Language or Elective ²	4
Social Sciences [SSCI]	3

Second Term *Hours*

Diversity [DIVR]	3
Foreign Language or Elective ²	4
PHIL 207	3
Elective Core ³	3
Electives	3
Complete Writing Portfolio	

THIRD and FOURTH Years [See "OPTIONS" below] 60

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² Students with two years high school foreign language are required to complete 2 additional semesters. Students without high school foreign language are required to complete 4 semesters.

³ Elective Core courses: FOR LANG 102, HUMANITY 101, or HUMANITY 335.

OPTIONS

Third and Fourth Years — Students must complete one of the following options. Options and Elective coursework must reflect University requirements of 120 total credits, 40 credits of 300-400-level coursework, two [M] courses, and a [CAPS] course.

Western Religions: HISTORY 272, 445, PHIL 407, and seven courses from: ANTH 330, ENGLISH 305, 306, 485, FINE ART 201, 202, HISTORY 341, 423, 440, 441, HUMANITY 101, 302 [M], PHIL 320, 322, 413, 420, or 446.

Non-Western Religions: HISTORY 273, PHIL 314 [M], 315 [M], 407, and six courses from: ANTH 303, 330, FINE ART 201, 202, 302 [M], HISTORY 270, 275, 308, 370, 373, 374, 472 [M], 473, or HUMANITY 350.

Comparative Religions: HISTORY 273, 407, 445, PHIL 314 [M], 315 [M], and five courses from: ANTH 303, ENGLISH 305, 306, 483, 485, FINE ART 201, 202, 302 [M]; HISTORY 308, 341, 370, 373, 374, 440, 441, 472 [M], 473, or HUMANITY 350.

GENERAL STUDIES - SOCIAL SCIENCES

**OPTION: PERSONNEL PSYCHOLOGY/
HUMAN RESOURCES (VANCOUVER-ONLY
OPTION)
(120 HOURS)**

L. Volk, Academic Coordinator

The Personnel Psychology/Human Resources (PP/HR) option is designed to provide human resource professionals, and those preparing for a career in human resources, the tools to be effective managers. 120 credit hours are required, including completion of WSU UCORE requirements, CAS requirements, and a combination of social sciences courses totaling 40 upper-division hours from three academic areas (psychology, human development, and management). The GPA for the 40 hours must be a 2.00 minimum. Students declare the General Social Sciences major (Gen S) and receive a Bachelor of Arts in Social Sciences with an Option in Personnel Psychology/Human Resources.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
ENGLISH 101 [WRTG]	3
Humanities [HUM]	3
Quantitative Reasoning [QUAN]	3
Social Sciences [SSCI]	3

<i>Second Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
Creative & Professional Arts [ARTS]	3
HISTORY 105 [ROOT]	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4

Second Year

<i>First Term</i>	<i>Hours</i>
PSYCH 306	3
Foreign Language, if necessary, and/or Electives	12

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3

Diversity [DIVR]	3
PSYCH 308	3
Foreign Language, if necessary, and/or Electives	6
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
H D 406	3
MGMT 301	3
PSYCH 311	4
Area 1 Electives ²	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
Area 1 Electives ²	3
Area 2 Electives ³	3
Area 3 Electives ⁴	3
Electives	6

Fourth Year

<i>First Term</i>	<i>Hours</i>
Area 1 Electives ²	3
Area 2 Electives ³	3
Area 3 Electives ⁴	3
Electives	6

<i>Second Term</i>	<i>Hours</i>
Integrative Capstone [CAPS]	3
Area 3 Electives ⁴	3
Electives	9

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² Area 1 electives: PSYCH 309, 350, 412, 470, or 495.

³ Area 2 electives: H D 301, 350, 385, 403, or 430.

⁴ Area 3 electives: I BUS 453 [M], MGMT 401 [M], 450, 455 [M], 456, 485, 487, 496. Must include two [M] courses.

**GENERAL STUDIES - SOCIAL SCIENCES/
HUMANITIES PLAN A
(120 HOURS)**

T. Whitacre, Coordinator

This division of general studies is for students whose primary interest in the humanities or social sciences requires programs and course selections which are not possible within single academic units or established curricula. Students who wish to earn a Bachelor of Arts in Humanities or a Bachelor of Arts in Social Sciences will devise an approved, coherent program of study which fulfills an academic or career goal and includes prerequisites consistent with the 300-400-level course work. In addition, each student will satisfy the UCOREs and any additional requirements of the College of Arts and Sciences.

Plan A—Primary/Secondary Concentration

Primary concentration: a minimum of 24 semester credits, including at least 15 300-400-level credits, must be completed in a single humanities or social sciences department or published program with a minimum 2.00 primary concentration GPA. The

degree (Gen H or Gen S) will depend on the primary concentration.

Secondary concentration: a minimum of 15 semester credits, including at least 6 300-400-level credits, must be completed in another academic department, program or area published in the catalog with a minimum 2.00 GPA.

For a list of approved Plan A areas, please contact the Liberal Arts General Studies office.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3
Humanities [HUM]	3
Quantitative Reasoning [QUAN]	3

<i>Second Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
HISTORY 105 [ROOT]	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4
Social Sciences [SSCI]	3
Foreign Language, if necessary, or Elective	3 or 4

Second Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
Primary Concentration	3
Secondary Concentration	3
Foreign Language, if necessary, and/or Elective	6

<i>Second Term</i>	<i>Hours</i>
Diversity [DIVR]	3
Primary Concentration	3
Secondary Concentration	3
Electives	4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
300-400-level Primary Concentration ²	3
Primary Concentration	3
Secondary Concentration	3
Electives	6

<i>Second Term</i>	<i>Hours</i>
300-400-level Primary Concentration ²	3
300-400-level Secondary Concentration ²	3
Integrative Capstone [CAPS]	3
Electives	6

Fourth Year

<i>First Term</i>	<i>Hours</i>
300-400-level Primary Concentration ²	6
300-400-level Secondary Concentration ²	3
Electives ²	6

<i>Second Term</i>	<i>Hours</i>
300-400-level Primary Concentration ²	3
Electives ²	12

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101

[SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² Students must take a total of 40 hours of upper-division (300-400 level). 21 upper-division hours must be taken within the designated concentration areas. The UCORE requirements include 3 upper-division hours. The remaining 16 hours may be taken in the electives, the UCOREs, or by electing to take more than the minimum required in the areas. Among the 300-400 level course work in the areas, two courses, each at 3 hours, must have a [M] designation.

GENERAL STUDIES - SOCIAL SCIENCES/ HUMANITIES PLAN B (120 HOURS)

T. Whitacre, Coordinator

Humanities: A combination of humanities courses totaling at least 39 hours involving three academic areas with a minimum of 9 hours in each of the three areas. At least 21 of the 39 hours must be at the 300-400 level and the GPA for the 39 hours must be a 2.00 minimum. Students declare the General Humanities major (Gen H) and receive a Bachelor of Arts in Humanities.

Social Sciences: A combination of social sciences courses totaling at least 39 hours involving three academic areas with a minimum of 9 hours in each of the three areas. At least 21 of the 39 hours must be at the 300-400 level and the GPA for the 39 hours must be a 2.00 minimum. Students declare the General Social Sciences major (Gen S) and receive a Bachelor of Arts in Social Sciences.

For a list of approved Plan B areas, please contact the Liberal Arts General Studies office.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
Creative & Professional Arts [ARTS]	3
HISTORY 105 [ROOT]	3
Humanities [HUM]	3
Quantitative Reasoning [QUAN]	3
<i>Second Term</i>	
Communication [COMM] or Written Communication [WRTG]	3
ENGLISH 101 [WRTG]	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4
Social Sciences [SSCI]	3
Electives	3

Second Year

<i>First Term</i>	<i>Hours</i>
Area 1	3
Area 2	3
Foreign Language, if necessary, and/or Electives	7
<i>Second Term</i>	
Area 1	3
Area 3	3
Diversity [DIVR]	3
Foreign Language, if necessary, and/or Electives	6
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
300-400-level Area 1 ²	3
Area 2	3
Area 3	3
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
Electives	3
<i>Second Term</i>	
300-400-level Area 2 ²	3
300-400-level Area 3 ²	3
Integrative Capstone [CAPS]	3
Electives	6

Fourth Year

<i>First Term</i>	<i>Hours</i>
300-400 Any Area ²	9
Electives ²	6
<i>Second Term</i>	
300-400 Any Area ²	3
Electives ²	12

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² Students must take a total of 40 hours of upper-division (300-400 level). 21 upper-division hours must be taken within the designated concentration areas. The UCORE requirements include 3 upper-division hours. The remaining 16 hours may be taken in the electives, the UCOREs, or by electing to take more than the minimum required in the areas. Among the 300-400 level course work in the areas, two courses, each at 3 hours, must have a [M] designation.

GENERAL STUDIES - TEACHER TRAINING

Students who are preparing to teach at the secondary level may in some cases receive their degrees in general studies. Such students must fulfill the requirements for graduation of the College of Arts and Sciences. There are no further requirements if they complete their teaching major and minor and fulfill all the requirements for teaching certification. The degree awarded is Bachelor of Arts in Humanities, Bachelor of Arts in Social Sciences, or Bachelor of Science according to the endorsement granted in the student's major teaching field.

The secondary teaching major in physical science will receive a Bachelor of Science degree.

For further information on teaching certification, refer to the Department of Teaching and Learning.

Minors

American Indian Studies

M. Holloman, Coordinator

The minor in American Indian Studies requires 18 semester hours which shall include a required 9 hour core (3 of the following 4 courses: ANTH 320, CES

171, HISTORY 308, or HISTORY 410) and 9 hours of electives (ANTH 327, 331, 334, 535, CES 372, 373, 379, 470, 475, FINE ART 301, HISTORY 410, or MUS 265). At least 9 of the credits must be taken in residence at WSU or through WSU-approved education abroad or educational exchange courses, and at least 9 hours must be at the 300-400 level. A minimum of 12 credits must be taken for a letter grade and a minimum GPA of 2.00 is required in the minor coursework.

Global Studies

<http://libarts.wsu.edu/genstudies/>
509-335-0397

I. Webber, (Faculty Coordinator) and L. Heustis (Advisor)

Global studies examine economic, political, social, cultural, and scientific practices in a transnational and cross-cultural perspective. The Global Studies minor is designed to provide students with an integrated exposure to globally related scholarship across the disciplines, and encourages a student in any major discipline to think in terms of the globalization that marks the contemporary world. The program of study is designed to provide an exciting interdisciplinary global perspective on the arts, humanities, social sciences, and sciences. The minor is flexible and complements majors from across the University, affording students the opportunity to reach beyond their majors, or to take courses related to their majors outside of the context of the United States.

To certify towards the minor, students must have completed at least 60 credits hours with a 2.0 GPA or above. To earn the minor, students must complete a minimum of 18-19 credit hours: 1 core course in each student learning outcome category (12-13 credits), and 2 course electives (6 credits) in any of the thematic categories listed in the program of studies, but targeting two different learning outcomes. At least 9 credits of approved coursework must be taken at the 300-400 level, and no courses taken Pass/Fail will count towards the 18-19 credit requirement. Six hours of approved transfer work may be counted towards the minor; the remaining 12-13 hours must be taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. No more than two courses with the same subject (or content, as in cross-listed courses) can be applied to the minor. Some courses may be substituted with the approval of the Global Studies Minor advisor. Additional courses may be included within the minor as developed in the university curriculum.

Student Learning Outcomes: The minor gives students a competitive edge in the global job market. Students earning the minor will be prepared to 1) understand connections that can be made from historical, cultural, economic, and political contexts that shape society and reflect global systems; 2) demonstrate knowledge of and be sensitive to others' differing identities and values across cultures; 3) apply intercultural communication skills to interact effectively with individuals and in groups; and 4) interact respectfully and responsibly across boundaries in diverse environments.

Program of Studies:

Core Courses: Choose one from ANTH 203, CES 244, ECONS 101, 198, POL S 103, or SOC 415.

Choose one from ANTH 316, FINE ART 202, or POL S 428. Choose one from: COM 105, COMSOC 321, or FOR LANG 120. PLUS, complete one semester of foreign language study at WSU beyond the WSU admissions requirement. Foreign language courses taken at WSU to fulfill the admissions requirement are not eligible to be applied to the minor.

Electives: Six credits Required. Choose two courses targeting two different learning outcomes (SLOs):

SLO 1 Connections among contexts: ANTH 260, CES 380, CROP SCI 360, ENGLISH 373, FINE ART 301, GEOLOGY 390, HISTORY 494 or 495 or approved upper-level World History course, HONORS 370, 380, 390, I BUS 380 or 470, POL S 429, SOC 334 or 430.

SLO 2 Knowledge about identities and values: ANTH 301 or 404, BIOLOGY 407, ENTOM 150, ENVR SCI 101, FOR LANG 110, HUMANITY 350, MUS 163 or 265, or POL S 435.

SLO 3 Communication skills: Additional semester of same foreign language as used for the Core requirement or additional foreign language course taught in the foreign language at WSU.

SLO 4 Respectful interaction: BIOLOGY 110, NATRS 312, ANTH 418, COMSOC 421, or HISTORY 491.

Religious Studies

M. Myers, Coordinator

For a minor in religious studies, a student must take at least 18 semester hours of work, of which at least half must be 300-400-level taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. The minor includes the core (minus the Seminar in Religious Studies) and three courses from the required list of comparative religion.

Certificates

Certificate in American Indian Studies

Michael Holloman, Coordinator

The certificate in American Indian Studies requires 18 semester hours which shall include a required core (9 hours) and 9 hours of electives. 15 of the credits must be taken at WSU, and 9 hours must be at the 300-400-level. A minimum of 12 credits must be taken for a letter grade and a grade of C or better must be earned in each of the required and recommended courses in order to qualify for the certificate. Any currently enrolled degree-seeking student is eligible to enroll in the certificate program. Other students must meet the existing admissions standards for non-degree seeking students. The university undergraduate certificate fee will apply. Students must complete 3 of the following 4 courses: ANTH 320, CES 171, HISTORY 308, or HISTORY 410. The remaining 9 hours are chosen from the following elective courses: ANTH 327, 331, 334, 535, CES 372, 373, 379, 470, 475, FINE ART 301, HISTORY 410, or MUS 265. Other courses in American Indian studies may be added to the elective pool as they become available. Contact Michael Holloman, coordinator, for more information.

General Studies — Sciences

Thompson 309
509-335-4581

Director, A. M. Rodriguez-Vivaldi; Associate Director, L. Hufford.

General Studies - Sciences is for students who have varied interests that may cut across the usual departmental boundaries and who wish to play a role in deciding on a suitable curriculum of study. General Studies- Sciences seeks to prepare students for a wide variety of opportunities after graduation ranging from professional and graduate school to entry into business and industry. Graduates of General Studies- Sciences are expected to: 1) have a thorough understanding and knowledge of their major area of study; 2) understand and critically analyze research and journals from their field of study; 3) communicate clearly about their field to a wide variety of audiences, and 4) understand that they will need to engage in lifelong learning to stay current in their field. The degree offered is the Bachelor of Science. The degree is not identified with a specific subject-matter field on the diploma.

Students work with specific academic advisors in the College of Arts and Sciences to plan individual programs of study leading towards the Bachelor of Science degree. If you are interested in pursuing General Studies - Sciences, you must meet with the appropriate advisor as soon as possible. The School of Biological Sciences administers two options under General Studies- Sciences: General Studies—Biological Sciences and General Studies—Basic Medical Sciences. Two other options, General Studies- Mathematics, and General Studies-Physical Sciences are advised by the Department of Mathematics and the Department of Physics & Astronomy, respectively. For more information on specific advisors and how to contact them, go to <http://cas.wsu.edu/academics/advisors/index.html>. mm

Student Learning Outcomes

- Ability to understand and communicate effectively about scientific or mathematical concepts.
- Ability to think critically and adapt concepts to analyze and solve problems
- Ability to apply scientific or mathematical skills in formulating logical hypotheses to explain natural phenomena.
- Ability to design tests of hypotheses through experiments, observational studies, mathematical models, or statistical tests.
- Ability to identify central body of knowledge in a scientific discipline or mathematical specialty.
- Ability to use scientific or mathematical knowledge to analyze contemporary social, cultural, and environmental issues and contribute to informed opinion.

Plans of Study

Students may follow Plan A or Plan B for each of the General Studies options below, except for the Mathematical Science option which offers only the Plan A option. All options require 120 credit hours for the degree. In addition, students will satisfy the University Core Requirements and College of Arts and Sciences graduation requirements. Students must complete two [M] courses and at least 40 of

the 120 hours for the degree must be at the 300-400-level. Honors students must complete the Honors College requirements which replace the UCORE requirements, but must satisfy the College of Arts and Sciences graduation requirements.

Students who complete a General Studies Science curriculum receive a Bachelor of Science degree. The transcript (not the diploma) will identify the option and areas of concentration.

Plan A—Primary/Secondary Concentration:

Primary concentration: a minimum of 24 semester credits, including at least 15 upper division (300-400-level) credits, must be completed in biological sciences, in mathematics, or in a single physical science with a minimum 2.00 primary concentration GPA.

Secondary concentration: a minimum of 15 semester credits, including at least 6 upper division (300-400-level) credits, must be completed in an area specified by the option or in another academic program with a minimum 2.00 GPA.

Plan B—Three Related Areas in Biological Sciences or Physical Sciences:

A combination of biological sciences or physical sciences courses of at least 39 credits in three or more related academic areas; 9 credits in each academic area are required and 21 upper division (300-400-level) credits must be completed with at least a 2.0 GPA. The related areas in general biological sciences include biology, biochemistry, botany, genetics and cell biology, microbiology, zoology, and approved biology-based courses in agriculture. The related areas in general physical sciences are broadly defined and include astronomy, chemistry, geology, mathematics, physics, and approved courses in computer sciences and engineering.

Options

General Studies—Biological Sciences is an option for students who want a curriculum of study that cuts across disciplines but has biology at the core of integrative studies. This degree has two plans of study (Plan A or Plan B). Both require prerequisites of one year biology, one semester introductory calculus, one year general chemistry, and one semester organic chemistry. The academic areas from which courses may be drawn include biology, biochemistry, botany, genetics and cell biology, microbiology, zoology, and approved biology-based courses in agriculture. However, students may not use General Studies Biological Sciences as part of a double major with either biology or zoology. Students will work with their academic advisor in the School of Biological Sciences to plan individual courses of study for this option of the Bachelor of Science degree.

General Studies—Basic Medical Sciences supports students who aim for a career in health fields, including professional training in medicine, dentistry, and pharmacy, and want a curriculum of study that cuts across the boundaries of existing majors. This degree has two plans of study (Plan A or Plan B). Either will help students to meet the requirements for admission to medical, dental, or pharmacy schools, or other health science professional programs. Plan A students have a primary concentration of biological sciences and secondary concentration of Chemistry. Plan B

requires courses from three related areas of biological sciences (BIOLOGY, MBIOS, and NEUROSCI). Students will work with their academic advisor in the School of Biological Sciences to plan individual courses of study for the B.S. General Studies—Basic Medical Sciences.

General Studies- Mathematical Sciences is an option for students who want a curriculum of study that cuts across disciplines but has Mathematics at the core of integrative studies. Plan A is the only option offered for this degree. It requires prerequisites of three semesters of calculus and linear algebra. Students will work with the academic advisor in the Department of Mathematics and Statistics to plan individual courses of study for this option of the Bachelor of Science degree.

General Studies- Physical Sciences is an option for students who want a curriculum of study that cuts across disciplines but has Physics or another Physical Science such as Chemistry at the core of integrative studies. This degree has two plans of study (Plan A or Plan B). Both require prerequisites of one year calculus, one year calculus-based physics, and one year general chemistry. Students must satisfy all prerequisite work for 300-400 level courses. Students will work with the academic advisor in the Department of Physics and Astronomy to plan individual courses of study for this option of the Bachelor of Science degree.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

GENERAL STUDIES - BASIC MEDICAL SCIENCES PLAN A (120 HOURS)

At least 40 of the 120 hours for the degree must be at the 300-400-level.

First Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI]	4
CHEM 105 [PSCI] ¹	4
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 107	4
CHEM 106	4
HISTORY 105 [ROOT]	3
MATH 140 [QUAN] or 171 [QUAN] ²	4

Second Year

<i>First Term</i>	<i>Hours</i>
CHEM 345	4
Communication [COMM] or Written Communication [WRTG]	3
MBIOS 301	4
Foreign Language, if necessary, or Elective ³	3

<i>Second Term</i>	<i>Hours</i>
CHEM 348	3
Social Sciences [SSCI]	3
Foreign Language, if necessary, and/or Electives ³	9
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
Diversity [DIVR]	3
MBIOS 303	4
PHYSICS 101 ⁴	4
Electives ³	3

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
PHIL 365 [HUM]	3
PHYSICS 102	4
Electives ³	6

Fourth Year

<i>First Term</i>	<i>Hours</i>
Degree Program Elective ⁵	2-4
Degree Program Elective [M] ⁵	3
300-400-level Electives	6
Electives ³	5

<i>Second Term</i>	<i>Hours</i>
Degree Program Elective [M] ⁵	3
Integrative Capstone [CAPS]	3
300-400-level Electives	6
Electives ³	4

¹ CHEM 101 may be taken prior to CHEM 105.

² MATH 106 may be taken the first semester as a prerequisite to other MATH courses and as a co-requisite to CHEM 105. MATH 108 may also be needed. In addition to either MATH 140 or 171, a statistics course is highly recommended, and for some programs, required.

³ Students are encouraged to pursue a minor in other areas of more in-depth science minor.

⁴ An elective may be substituted for PHYSICS 101 and 102 if it is not required for entrance to a graduate or professional program.

⁵ Degree Program Electives (8 credits required): Approved courses are BIOLOGY 315, 321 [M], 324, 350, 352, 353, 393 [M], 405, 418 [M]; MBIOS 304, 305, 401, 413, 414, 423, 440, 442, 446; NEUROSCI 301, 403 [M], 404, and 430 [M].

GENERAL STUDIES - BASIC MEDICAL SCIENCES PLAN B (120 HOURS)

At least 40 of the 120 hours for the degree must be at the 300-400-level.

First Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI]	4
CHEM 105 [PSCI] ¹	4
Creative & Professional Arts [ARTS]	3
HISTORY 105 [ROOT]	3

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 107	4
CHEM 106	4
ENGLISH 101 [WRTG]	3
MATH 140 [QUAN] or 171 [QUAN] ²	4

Second Year

<i>First Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3

CHEM 345	4
MBIOS 301	4
PHYSICS 101 ³	4

<i>Second Term</i>	<i>Hours</i>
CHEM 348	3
MBIOS 305	3
MBIOS 306	2
PHYSICS 102 ³	4
Social Sciences [SSCI]	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
Degree Program Elective ⁴	3 or 4
Diversity [DIVR]	3
MBIOS 303	4
Foreign Language, if necessary, and/or Electives ⁵	6

<i>Second Term</i>	<i>Hours</i>
PHIL 365 [HUM], or Humanities [HUM]	3
Degree Program Elective ⁴	6 - 8
Foreign Language, if necessary, and/or Electives ⁵	6

Fourth Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
Degree Program Elective ⁴	3 or 4
Degree Program Elective [M] ⁴	2 - 4
Electives ⁵	7

<i>Second Term</i>	<i>Hours</i>
Degree Program Elective ⁴	3 or 4
Degree Program Elective [M] ⁴	3 or 4
Integrative Capstone [CAPS]	3
Electives ⁵	6

¹ CHEM 101 may be taken prior to CHEM 105.

² MATH 106 may be taken the first semester as a prerequisite to other MATH courses and as a co-requisite to CHEM 105. MATH 108 may also be needed. In addition to either MATH 140 or 171, a statistics course is highly recommended, and for some programs, required.

³ An elective may be substituted for PHYSICS 101 and 102 if it is not required for entrance to a graduate or professional program.

⁴ Degree Program Electives: A combination of 39 science credits, with 21 credits in 300-400-level courses, is required. 20 credits must be selected from the following list and must include a minimum of one each BIOLOGY, MBIOS, and NEUROSCI: BIOLOGY 251, 315, 321 [M], 324, 333, 350, 352, 353, 393 [M], 405, 418 [M]; MBIOS 304, 360 [M], 401, 402 [M], 413, 414, 423, 440, 442, 446; NEUROSCI 301, 403 [M], 404, and 430 [M].

⁵ Students are encouraged to pursue a minor.

GENERAL STUDIES - BIOLOGICAL/MATHEMATICAL/PHYSICAL SCIENCES PLAN A AND PLAN B (120 HOURS)

The Biological/Mathematical/Physical Sciences plan within General Studies is for students who are interested in interdisciplinary programs in science or mathematics which offer broader options in course selections than are possible within single departments. Students who wish to earn a Bachelor

of Science degree will devise an approved, coherent program of study with the coordinator which fulfills an academic or career goal and includes prerequisites consistent with the 300-400-level major course work.

General Studies—Biological Sciences. This degree has two plans of study (Plan A or Plan B). Both require BIOLOGY 106 and 107, CHEM 105, 106, and 345, and MATH 140 or 171.

Plan A students complete 24 credits (minimum 15 credits at the 300-400 level) from the following academic areas: biology, biochemistry, botany, genetics and cell biology, microbiology, zoology, and approved biology-based courses in agriculture. In addition, students must complete a 15 credits (minimum 6 credits upper division) from a concentration area outside of the biological sciences. Both concentration areas require a minimum 2.0 GPA.

Plan B students complete a total of 39 credits (minimum 21 credits at the 300-400 level) in three or more departments or program areas chosen from biology, biochemistry, botany, genetics and cell biology, microbiology, zoology, and approved biology-based courses in agriculture. Students must complete a minimum of 9 credits in each department or program area with a minimum 2.0 GPA.

Students may not use General Studies Biological Sciences as part of a double major with either biology or zoology. Students will work with their academic advisor in the School of Biological Sciences to plan individual courses of study for this option of the Bachelor of Science degree.

General Studies- Mathematical Sciences. Primary Concentration: Students are required to complete minimum of 24 credits (minimum 15 credits at the 300-400 level) including MATH 171, 172, 273, and 220. Other approved coursework includes any MATH course, or STAT 360, 370, 422, 423, 443, 446, 447, or 456. Secondary concentration: a minimum of 15 semester credits (including a minimum 6 credits at the 300-400-level), must be completed in another academic department, program or area published in the catalog. Both concentration areas require a minimum 2.0 GPA.

General Studies- Physical Sciences. This degree has two plans of study (Plan A or Plan B). Both require, CHEM 105 and 106, MATH 171 and 172 and PHYSICS 201 and 202.

Plan A students must have a primary and secondary concentration. For the primary concentration students are required to complete minimum of 24 credits (minimum 15 credits at the 300-400 level) from one of the following areas any Astronomy, Civil Engineering, Chemical Engineering, Chemistry, Computer Science, Electrical Engineering, Geology, Math, Mechanical Engineering, Materials Science Engineering, Physics or Statistics. For the secondary concentration a minimum of 15 semester credits (including a minimum 6 at the 300-400-level), must be completed in another academic department, program or area published in the catalog. Both concentration areas require a minimum 2.0 GPA.

Plan B students must complete 39 credits (minimum of 21 credits in the 300-400 level) in three or more physical sciences with a minimum of 9 credits in each concentration area and a minimum 2.0 GPA in each concentration area.

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Regents Professor, Senior Director, and Creighton Chair, G. Palmer; Associate Director and Professor, T. Baszler; Associate Director and Professor, D. R. Call; Professors, T. E. Besser, K. A. Brayton, T. Marsh, J. Yoder; Associate Professors, H. Aguilar-Carreno, J. Celli; Assistant Professors, L. Knodler, E. Lofgren, A. Omsland, V. Vadyvaloo; Clinical Assistant Professors, F. Lankester, J. Zambriski; Research Professor, M. K. Njenga; Assistant Research Professors, M. Davis, E. S. Marshall, S.T. Mwangi; Clinical Research Professor, A. Du; Affiliate Professors, S. Broschat, A. S. Dhillon, S. Kurtz, D. A. Moore, W. M. Sischo; Affiliate Associate Professors, T. Bankhead, A. Kalyanaraman, R. Quinlan, M. McGuire, M. Memon, S. Roy, D. H. Shah; Affiliate Assistant Professors, O. Cornejo, A. Nicola, M. Quinlan; Affiliate Research Professor, A. Du; Adjunct Faculty, S. Cleveland, J. Futse, M. F. Galletti, G. Kaufman, K. K. Lahmers, Y. Lin, B. Martin, S. M. Noh, I. O. Olatoye, S. Ramabu, M. Ueti; Regents Professor Emeritus, T. F. McElwain.

The Paul G. Allen School for Global Animal Health (Allen School) provides innovative solutions to global infectious disease challenges through research, education, global outreach, and application of disease control at the animal-human interface. It advances science, people, and policy to discover novel approaches for disease intervention and delivery of preventive health care for animals and humans. Graduate study leading to the Master of Science and Doctor of Philosophy degrees is offered for individuals with strong backgrounds in biological, economic, engineering, physical, and social sciences. The objectives of the program are to provide the graduate student with a broad knowledge of and research experience in global animal health with concentration in their specific disciplines placed in the global context of disease prevention and control. The curriculum is research intensive emphasizing the identification of knowledge gaps that constrain progress in improved global health, acquisition of contemporary and innovative investigative skills to address these gaps, and understanding of policy pathways to direct and enhance implementation of health solutions. Specialization includes animal and zoonotic disease epidemiology and pathogenesis, economic burden of disease and effect on food security, emerging and endemic disease surveillance and diagnosis, infectious diseases epidemiology and pathogenesis, vaccine discovery and development, implementation strategy and evaluation, and animal health policy and metrics.

The program offers flexibility for students with backgrounds in any of the core disciplines to pursue advanced training in global animal health, with independent study and original research in areas of the student's own interests. Students conduct research on the WSU-Pullman campus, including in the state-of-the-art BSL2 and BSL3 laboratories in the Allen Center, and in global field sites. The interdisciplinary nature of the program assures the

student of interaction with scientists representing a wide range of research interests in global health and provides the student with a broad range of specialized facilities which are available in the cooperating academic units.

UNIQUE ASPECTS OF THE PROGRAMS

- Multidisciplinary options. Students working with Allen School faculty can enroll in specific disciplinary programs such as Anthropology, Economics, Immunology/Infectious Diseases, and Molecular Biosciences or develop an individualized Interdisciplinary Program.
- Real-world education. Blending rigorous academic training with experiential learning
- Learning from leaders in the discipline. Providing students with opportunities to work with top scientists, practitioners, and leaders in global animal health, both on campus and in the field.

Certificates

Global Animal Health Pathway

The Global Animal Health Pathway (GAHP) requires a minimum of 15 course credits to earn a certificate. These credits will be satisfied through both required and elective courses: 5 credits will be satisfied through required coursework, 6 credits (minimum) will be satisfied through the required GAH Project, and the remaining credits, up to 4, will be satisfied through elective courses or additional project work. Elective credits may be obtained from courses offered by WSU, and on-line courses offered through the University of Washington Global Health Pathway that are approved for the GAHP. Required courses and approved elective courses are listed below. Students wishing to enroll in the GAHP program must maintain a minimum satisfactory level or 3.00 GPA in graded professional coursework and remain in the upper 75% of the DVM class.

- REQUIRED COURSES (5 credits): VET MED 501, 597 (Section 6), 576, 600, and GLANHLTH 503.
- REQUIRED GLOBAL ANIMAL HEALTH PROJECT (6 credits minimum): All GAHP students will be required to complete a global animal health project. The student will work with an Allen School faculty mentor to design a project, which may be completed in conjunction with a project team outside the Allen School. The project must be oriented toward global animal health and be approved by the GAHP Advisory Committee. The student will register for VET MED 600P (Scientific Writing and Presentation – required in DVM curriculum, see above under required courses) for project write-up and presentation. The student will devote at least 6 weeks (6 credits) during one summer to complete this requirement and should register for one or more of the following WSU courses to meet the required course credit. Coursework: VET MED 504, 599, 676, or 690.
- ELECTIVE COURSES (up to 4 additional credits): Elective course credits may be earned through formal classroom instruction during any semester or summer session and/or through the completion of an additional summer project. Coursework: VET MED 504, 599, 676, 690, SPANISH 362, or SPANISH 405.
- Foreign Language Skills. A foreign language is not required, but is highly recommended. The foreign language proficiency provides students with an in-depth understanding of cultural and contextual

elements critical to working in the field of global animal health. Further, foreign language proficiency will increase the graduate's competitiveness for global health career opportunities upon graduation.

Description of Courses

GLOBAL ANIMAL HEALTH

GLANHLTH

- 500 Animal Health and Food System Policy and US State Government** 1 Policy-making process relating to trade, animal health and food systems at the state and provincial levels.
- 501 Animal Health and Food System Policy and US National Government** 1 Policy-making process relating to trade, animal health and food systems at the national level.
- 502 Animal Health and Food System Policy and Intergovernmental Organizations** 1 International policy-making emphasizing the impact of international standards and policy of food safety, animal health, trade and public health.
- 503 Animal Human Disease Interface** 1 Use of evidence-based tools in addressing global animal health challenges at the human-animal interface.
- 504 Multidisciplinary Approaches to Global Health Challenges** 1 Multidisciplinary collaboration around an important global health problem that includes a significant animal health component.
- 563 Deconstruction of Research** 3 Course Prerequisite: Graduate standing in a WSU biomedical based graduate program. Nature and development of scientific investigation through oral and written avenues, and methods of critical analyses applied to questions of biomedical interest. (Crosslisted course offered as NEUROSCI 563, GLANHLTH 563, MBIOS 563, VET MICR 563, VET PATH 563, VET PH 563).

Department of Health Policy and Administration

<https://nursing.wsu.edu/academics/mhpa>
 665 N. Riverpoint Blvd. 424
 509-358-7980
hpa@wsu.edu

Chair and Professor, J. Kennedy; Associate Professor, S. Murphy; Clinical Associate Professor, G. Smith.

The Department of Health Policy and Administration (HPA) offers the Master of Health Policy and Administration degree at WSU Spokane. The mission of the Department of Health Policy and Administration is: 1) to offer a world-class graduate education to the next generation of health administrators, policy analysts, and health services researchers; and 2) to generate new knowledge and competencies that improve access, quality, efficiency, and equity of health services, both domestically and internationally. The vision of the WSU Department

of Health Policy and Administration is to expand and improve our nationally recognized health administration education program and to enhance our portfolio of extramurally funded research.

The 56 credit-hour curriculum includes: Introductory courses (Introduction to the Health Care System; Health Care Cost Accounting; Health Care Finance; Health Care Law; Health Care Management; Biostatistics and Epidemiology for the Health Sciences; Marketing for Health Care Organizations); core courses (Health Care Economics; Health Care Policy and Politics; Health Care Human Resources Management; Research and Evaluation Methods; Health Care Information Systems); elective and professional skills development courses; 3-credit internship; capstone course (Strategic Management and Marketing); and 4-credit required graduate project or thesis.

The graduate program in Health Policy and Administration is accredited by the Commission on Accreditation of Healthcare Management Education (CAHME). According to the Association of University Programs in Health Administration Directory of Programs, "[CAHME] is recognized by the Council for Higher Education Accreditation (CHEA) which oversees accreditation of the nation's colleges and universities, and by the Department of Education, as the only accrediting agency in the field of health services administration. Accreditation by [CAHME] is the most important assurance that a graduate program meets the quality standards developed by the profession and the health services industry."

The HPA Program is also admitted to the Western Interstate Commission for Higher Education (WICHE) Western Regional Graduate Program (WRGP). According to WICHE, WRGP "consists of very high quality masters and doctoral degree programs which tend not to be widely available throughout the West." Admission of the HPA Program means that residents of Alaska, Arizona, California, Colorado, Commonwealth of the Northern Mariana Islands (CNMI), Hawaii, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming are eligible to enroll at Washington resident rates of tuition. The WSU Health Policy and Administration Program is the only health administration program admitted to WRGP of the four CAHME-accredited programs in the WRGP region.

Students who have at least one year of residency in one of these 16 western states are automatically enrolled under WICHE/WRGP status when they are admitted to the HPA program. Part-time students are eligible to participate in WRGP if they have been admitted to a WRGP program.

Admission standards conform to the requirements of the WSU Graduate School. An undergraduate GPA of 3.0 or better is expected. In addition, GRE or GMAT scores are required for admission to the HPA Program, except for applicants holding a professional doctoral degree (e.g., MD, JD, DDS) or PhD from a US accredited school. Significant weight is given to GRE aptitude (verbal and quantitative combined) total scores of at least 300, or a GMAT aptitude score of at least 500. However, indications of academic ability as expressed by undergraduate grade point average and professional experience are of greater importance than specific undergraduate background and GRE or GMAT scores.

For additional information, please call (509) 358-7980 or visit <http://nursing.wsu.edu/academics/mhpa/>.

Description of Courses

HEALTH POLICY AND ADMINISTRATION

HPA

- 500 Introduction to the Health Care System** 3 Orientation to history and organization of the health care system.
- 501 Health Care Policy and Politics** 3 History, methods, results and evaluation of health-care-related policy and politics.
- 502 Law and Ethics of Health Management** 3 Private health law and ethics, including professional liability, relationship of physician and patient, malpractice reform, health institutions, and health access.
- 503 Government Regulation of Health Services** 3 Public law regulation; health care quality, personhood and individual autonomy, life/death decisions, antitrust, health care financing and cost control.
- 509 Health Care Economics** 3 The economics of allocating, financing and delivering health care services. Cooperative: Open to UI degree-seeking students.
- 510 Health Care Cost Accounting** 3 Basic cost-accounting concepts, principles, and applications in the health care setting.
- 511 Health Care Finance** 3 Aspects of health care financial management fundamentals and managerial accounting for strategic financial management.
- 515 Health Care Management** 3 Introduction to the knowledge, skills, and values associated with the practice of health management.
- 517 Health Care and Human Resources Management** 3 Managing human resources and health professionals in diverse health care environments such as hospitals, clinics, home health care agencies and pharmaceutical firms.
- 519 Biostatistics and Epidemiology for the Health Sciences** 3 Application of quantitative methods to problems in the health sciences; statistical analysis software.
- 520 Research and Evaluation Methods** 3 Basic research and evaluation methods for health care professionals.
- 530 Health Care Information Systems** 3 Key attributes of health care information systems and their evolution in health care environment.
- 550 Operations Management I: Project Management** 3 Course Prerequisite: Admission to the MHPA program. Comprehensive overview of management theory through the use of an educational experience in project management.
- 570 Marketing for Health Care Organizations** 3 Basic marketing concepts, principles, and issues related to marketing public and private health care.
- 590 Strategic Management and Marketing** 3 Key components and processes in strategic planning.

597 Internship V 1-5 May be repeated for credit; cumulative maximum 5 hours. Student experience in professional work settings. S, F grading.

599 Special Topics in Health Policy and Administration V 1-3 May be repeated for credit; cumulative maximum 9 hours.

600 Special Projects or Independent Study V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.

700 Master's Research, Thesis, and/or Examination V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

702 Master's Special Problems, Directed Study and/or Examination V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

A major in history can be used in government service, the new specialty of public history teaching, several areas of business and industry, and many other fields. It can also be used in preparation for study of the law, the ministry, archival work, and librarianship. Double majors or complementary minors combining history with other fields are easily arranged.

The department offers courses of study leading to the degrees of Bachelor of Arts in History, Bachelor of Arts in Social Studies, Master of Arts in History, and Doctor of Philosophy. In cooperation with others, the department participates in the interdisciplinary Program in American Studies leading to the degree of Doctor of Philosophy.

Preparation for Graduate Study

Students who have had basic undergraduate training in history (approximately 12 hours) and who have had undergraduate majors in such subjects as American literature, economics, anthropology, and political science may be well prepared for graduate study in several fields of specialization in history. Adequate opportunities are provided for removing deficiencies by taking appropriate courses or special examinations.

Undergraduates who are pursuing their studies at other institutions or through other curricula at this institution and who contemplate graduate work in this department should select courses similar to those required in the schedule of studies.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

HISTORY - EDUCATION OPTION (120 HOURS)

Students who wish to earn a teaching credential must apply to the Teacher Preparation Program in the College of Education. They should consult with an advisor in history about choosing additional electives that may apply toward a minor or second major and that complement a History endorsement.

To certify in the History Education option, a student must have earned at least a 2.50 cumulative GPA.

A grade of C or better is required in all history courses used to fulfill the requirements for this degree.

Students must have one year of a foreign language at the college level or two years at the high school level.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
HISTORY 101 [HUM]	3
HISTORY 105 [ROOT]	3
Quantitative Reasoning [QUAN]	3 or 4

<i>Second Term</i>	<i>Hours</i>
ECONS 102 [SSCI], POL S 101 [SSCI], or PSYCH 105 [SSCI] ²	3
ENGLISH 101 [WRTG]	3

HISTORY 102	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4

Second Year

<i>First Term</i>	<i>Hours</i>
200-level HISTORY course ³	3
Creative & Professional Arts [ARTS]	3
ECONS 102 [SSCI], POL S 101 [SSCI], or PSYCH 105 [SSCI] ²	3
ENGLISH 201 [WRTG], 301 [WRTG], or 302 ⁴	3
HISTORY 110	3

<i>Second Term</i>	<i>Hours</i>
200-level HISTORY course ³	3
Diversity [DIVR]	3
ECONS 102, POL S 101, or PSYCH 105 ²	3
HISTORY 111	3
Foreign Language, if necessary	0 - 4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
300-400-level HISTORY courses ⁵	6
HISTORY 300 [M]	3
TCH LRN 301	3

<i>Second Term</i>	<i>Hours</i>
300-400-level HISTORY course ⁵	3
HISTORY 422	3
Integrative Capstone [CAPS]	3
TCH LRN 317	2
Foreign Language, if necessary	0 - 4

Fourth Year

<i>First Term</i>	<i>Hours</i>
300-400-level HISTORY course ⁵	3
HISTORY 469 [M]	3
TCH LRN 464	3
TCH LRN 465	3
TCH LRN 466	2

<i>Second Term</i>	<i>Hours</i>
ED PSYCH 468	3
HISTORY 480	3
TCH LRN 467 [M]	3
TCH LRN 469	2
TCH LRN 470	3

Fifth Year

<i>First Term</i>	<i>Hours</i>
TCH LRN 415	16

¹To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

²POL S 101 and ECONS 102 are state requirements for teacher certification in history and are recommended to fulfill UCORE or College of Arts and Sciences requirements

³Choose one from two separate categories: 1) HISTORY 230 or 231; 2) 270 or 271; 3) 272 or 273; 4) 275.

⁴One from ENGLISH 201, 301, 302, or 402 is required for admission to the Teacher Education Program. Students who take ENGLISH 302 will need

Department of History

libarts.wsu.edu/history/
Wilson-Short 301
509-335-5139

Professor and Department Chair, S. Kale; Professors, P. Boag, W. Brecher, C. Goucher, S. Hoch, L. Mercier, S. Peabody, M. Sutton, O. Svingen, M. Tolmacheva; Associate Professors, R. Bauman, B. Farley, N. Kawamura, R. McCoy, J. Sanders, J. Spohnholz, R. Sun, J. Thigpen, X. Wang; Assistant Professors, L. Hatter, A. Wright; Clinical Faculty, L. Gerber, T. Jordan, S. Fountain; Instructors, Y. Berliner, R. Chan, J. Dodson, R. Ellis, K. Faunce, P. Guingona, S. Herzog, K. Fry, N. Harrington, F. Hill, K. Phoenix, J. Secord, C. Stratton, L. Tumer-Rahman, J. Tyler, C. Weller, S. Wempe; Staff, K. Anderson, L. Torkelson, P. Gupptill.

Offerings in the field of history may be classified as American, Asian, European, and Latin American.

The Department of History's Undergraduate Degree Program is designed to produce several outcomes. We expect students who complete the requirements for an undergraduate major in History to: 1) express sophisticated and abstract concepts clearly in writing; 2) be familiar with the nature of historical argument and methodologies; 3) frame research topics and do research at an appropriate undergraduate level; 4) have a mastery of the broad outlines of historical developments, themes, issues, and patterns; 5) develop critical thinking skills that will allow and encourage them to become life-long learners.

to take an additional [WRTG] or [COMM] course.

⁵ History education majors must choose their 12 hours of 300-400 electives from the following: one from HISTORY 411, 413, 414, 415, or 416; one from HISTORY 412, 417, 418, or 419; one from HISTORY 340, 341, 342, 350, 381, 382, 386, 435, 440, 441, 444, 445, 447, 448, 450, 453, 454, 455, 459, 463, 466, 467, 468, or 489; and one from HISTORY 306, 315, 331, 335, 337, 370, 373, 374, 387, 388, 425, 430, 432, 433, 434, 435, 436, 439, 464, 466, 472, 473, 474, 475, 476, 477, 483, 491, 492, 494, or 495.

HISTORY - GENERAL OPTION (120 HOURS)

36 semester hours of history is required including 6 hours of US history, 6 hours of European history, and 9 hours of Non-Western/Global history; 21 hours at the 300-400-level, which must include HISTORY 300 and 469; and a 12 hour concentration (at least 6 hours 300-400-level) in the same or in related disciplines with the advisor's approval.

It is assumed that prior to the junior year the student will have completed courses meeting UCORE and College of Arts and Sciences requirements for graduation.

A grade of C or better is required in all history courses used to fulfill the requirements for this degree.

First Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3
Humanities [HUM]	3
Quantitative Reasoning [QUAN]	3 or 4
Electives	4

<i>Second Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
Diversity [DIVR]	3
HISTORY 105 [ROOT]	3
Social Sciences [SSCI]	3
Electives	3

Second Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
100-200-level HISTORY Electives ²	6
Electives	3

<i>Second Term</i>	<i>Hours</i>
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4
100-200-level Degree Program Course ³	3
100-200-level HISTORY Electives ²	6
Foreign Language, if necessary, or Elective	3 or 4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
100-200-level Degree Program Course ³	3
HISTORY Elective ²	3
300-400-level HISTORY Electives ²	6
Foreign Language, if necessary, or Elective	3 or 4

<i>Second Term</i>	<i>Hours</i>
HISTORY 300 [M]	3
300-400-level Degree Program Course ³	3
300-400-level HISTORY Elective	3
300-400-level Electives	6

Fourth Year

<i>First Term</i>	<i>Hours</i>
300-400-level Degree Program Course ³	3
300-400-level HISTORY Electives ²	6
300-400-level Electives	6

<i>Second Term</i>	<i>Hours</i>
HISTORY 469	3
Integrative Capstone [CAPS]	3
300-400-level Electives	6

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² History Electives must include 6 hours US history (HISTORY 110, 111, 150, 201, 205, 216, 280, 298, 308, 313, 314, 320 [M], 321, 322, 390, 398, 409, 410, 411, 412, 413 [M], 414, 415, 416, 417, 418, 419, 421, 422, 423, 427 [M], 486, or 496), 6 hours European history (HISTORY 101, 102, 340, 341, 342, 350, 381, 382, 386, 440, 441, 444, 445, 447, 449, 450 [M], 453, 454, 455, 459, 462, 463 [M], 467, 468, or 489 [M]), and 9 hours Non-Western/Global history (HISTORY 230, 231, 270, 271, 272, 273, 274, 275, 306, 331, 335, 337, 370, 373, 374, 387, 388, 425, 430 [M], 432, 433, 434, 435, 436, 439, 466, 472 [M], 473, 474, 475, 476 [M], 477 [M], 483, 491, 492, or 495).

³ Courses in the same or in related disciplines with the advisor's approval; students are encouraged to explore, in consultation with their advisor, a double-major or strong minor in a complementary subject field.

HISTORY - PRE-LAW OPTION (120 HOURS)

36 semester hours in history is required including 6 hours of US history, 6 hours of European history, and 9 hours of Non-Western/Global history; 12 hours of 100-200-level HISTORY; 3 hours of additional HISTORY; 21 hours of 300-400-level, which must include HISTORY 300 and 469. Included in the program of study below are 30 hours of courses in communication, social sciences and humanities, economics and business that are valuable preparation for study of the law. In addition to these requirements, students are urged to elect, in consultation with their advisor, courses that complement the curriculum's broad based liberal arts education.

To certify in the history pre-law option, a student must have earned at least a 2.50 cumulative GPA.

A grade of C or better is required in all History courses used to fulfill the requirements for this major.

It is assumed that prior to the junior year that students will have completed courses meeting UCORE and College of Arts and Sciences requirements for graduation.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
COM 102 [COMM]	3
ENGLISH 101 [WRTG]	3
Humanities [HUM]	3
Quantitative Reasoning [QUAN]	3 or 4

<i>Second Term</i>	<i>Hours</i>
ANTH 101 [DIVR]	3
Creative & Professional Arts [ARTS]	3
HISTORY 105 [ROOT]	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4
PSYCH 105 [SSCI]	3

Second Year

<i>First Term</i>	<i>Hours</i>
SOC 101	3
Pre-Law Option	3
100-200-level HISTORY Electives ²	6
Electives	4

<i>Second Term</i>	<i>Hours</i>
Pre-Law Option ³	6
100-200-level HISTORY Electives ²	6
Foreign Language, if necessary, or Elective	3 or 4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
HISTORY 300 [M]	3
Pre-Law Option ³	6
300-400-level HISTORY Elective ⁴	3
Foreign Language, if necessary, or Elective	3 or 4

<i>Second Term</i>	<i>Hours</i>
Pre-Law Option ³	3
300-400-level HISTORY Elective ⁴	6
300-400-level Electives	6

Fourth Year

<i>First Term</i>	<i>Hours</i>
300-400-level Pre-Law Option ³	3
300-400-level HISTORY Electives ⁴	6
300-400-level Electives	6

<i>Second Term</i>	<i>Hours</i>
HISTORY 469 [M]	3
Integrative Capstone [CAPS]	3
300-400-level HISTORY Elective ⁴	3
300-400-level Electives	3

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² Approved 100-200-level History electives: HISTORY 101, 102, 110, 111, 230, 231, 270, 272, 273, and 275.

³ Pre-Law requirements (may also fulfill UCORE requirements) – Political Science: POL S 300 and two courses from POL S 101, 102, or 206; Business/Accounting: two courses from ECON 101, 102, 198, ACCTG 230, or B LAW 210; Social Sciences/Humanities: one course from PHIL 201, 360, 370,

or 470; English: one course from ENGLISH 201, 301 or 402 [M].

⁴ The following courses are recommended to fulfill upper-division requirements: European History: 340, 341, 342, 440, 441, 444, 445, 447, 448, 450 [M], 453, 455, 459, 463 [M], 466, 467, or 468; American/ U.S. History: 414, 415, 416, 417, 418, 419, 421, 422, 423, 427 [M], 486, or 496.

SOCIAL STUDIES - EDUCATION OPTION (132 HOURS)

Social Studies is a major for students who plan to earn both a BA and a teaching endorsement in the multidisciplinary fields of history and the social sciences: anthropology, economics, geography, political science, psychology, sociology. Social Studies majors who wish to earn a teaching credential must apply to the Teacher Preparation Program in the College of Education. They should consult with an advisor in history about choosing additional electives that may apply toward a minor or second major and that complement a Social Studies endorsement.

To certify in Social Studies, a student must have earned at least a 2.50 cumulative GPA.

A grade of C or better is required in all history courses used to fulfill the requirements for this degree.

Students must have one year of a foreign language at the college level or two years at the high school level.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3
HISTORY 101	3
Quantitative Reasoning [QUAN]	3 or 4
<i>Second Term</i>	<i>Hours</i>
ANTH 101 [DIVR] or 203 [DIVR]	3
HISTORY 102	3
HISTORY 105 [ROOT]	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4
SOC 101 [SSCI]	3

Second Year

<i>First Term</i>	<i>Hours</i>
200-level HISTORY course ²	3
ECONS 102	3
HISTORY 110 [HUM]	3
POL S 101 [SSCI] or PSYCH 105 [SSCI]	3
Foreign Language, if necessary	0-4
<i>Second Term</i>	<i>Hours</i>
200-level HISTORY course ²	3
ENGLISH 201 [WRTG], 301 [WRTG], or 302 [M] ³	3
HISTORY 111	3
POL S 101 or PSYCH 105	3
Foreign Language, if necessary	0-4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
ANTH/PSYCH/SOC Elective ⁴	3
ECONS Elective ⁵	3

European History Elective ⁶	3
HISTORY 469 [M] or SOC 320 ⁷	3
TCH LRN 301	3

<i>Second Term</i>	<i>Hours</i>
ANTH/PSYCH/SOC Elective ⁴	3
Geography Elective ⁸	3
HISTORY 422	3
POL S Elective ⁹	3
TCH LRN 317	2

Fourth Year

<i>First Term</i>	<i>Hours</i>
Integrative Capstone [CAPS]	3
Non-Western/Global History Elective ¹⁰	3
TCH LRN 464	3
TCH LRN 465	3
TCH LRN 466	2

<i>Second Term</i>	<i>Hours</i>
American History Elective ¹¹	3
ED PSYCH 468	3
HISTORY 480	3
TCH LRN 467 [M]	3
TCH LRN 469	2
TCH LRN 470	3

Fifth Year

<i>First Term</i>	<i>Hours</i>
TCH LRN 415	16

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² Choose one from two separate categories: 1) HISTORY 230 or 231; 2) 270 or 271; 3) 272 or 273; 4) 275.

³ One from ENGLISH 201, 301, 302, or 402 is required for admission to the Teacher Education Program. Students who take ENGLISH 302 will need to take an additional [WRTG] or [COMM] course.

⁴ ANTH/PSYCH/SOC Electives (6 credits required): Approved courses include ANTH 307, 316, 320, 330, 331, 350, PSYCH 310, 324, 361, 470, SOC 320, 351, 384, and 430. Courses may not be used to fulfill more than one major requirement.

⁵ ECONS Elective (3 credits required): Approved courses include ECONS 320, 327, 404, 427, 428, and 430.

⁶ European History Elective (3 credits required): Approved courses include HISTORY 340, 341, 342, 350, 381, 382, 386, 440, 441, 444, 445, 447, 449, 450 [M], 453, 454, 455, 459, 462, 463 [M], 467, 468, and 489 [M].

⁷ Students who take SOC 320 may need to take an [M] course to fulfill University requirements

⁸ Geography Elective (3 credits required): Approved courses include ANTH 309, HISTORY 319, 495, and TCH LRN 487.

⁹ POL S Elective (3 credits required): Approved courses include POL S 300, 316, 427, and 455.

¹⁰ Non-Western/Global History Elective (3 credits required): Approved courses include HISTORY 306, 331, 335, 337, 370, 373, 374, 387, 388, 425, 430 [M], 432, 433, 434, 435, 436, 439, 466, 472[M], 473, 474, 475, 476 [M], 477 [M], 483, 491, and 492.

¹¹ American History Elective (3 credits required): Approved courses include HISTORY 308, 313, 314, 320 [M], 321, 322, 390, 398, 409, 410, 411, 412, 413 [M], 414, 415, 416, 417, 418, 419, 421, 422, 423, 427 [M], 486, and 496.

Minors

History

A minor in history requires 18 hours, 9 of which must be in 300-400-level courses taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. A grade of C or better is required in all course work for the minor.

Description of Courses

HISTORY

HISTORY

101 [HUM] Classical and Christian Europe 3 Survey of Europe, from 1000 B.C.E. to 1650 C.E. including Greece and Rome, Medieval Europe, the Renaissance and Reformation.

102 [HUM] Modern Europe 3 European history and its impact upon the global community from the seventeenth through twentieth centuries.

105 [ROOT] The Roots of Contemporary Issues 3 Foundational first-year course that explores the deep historical roots of global contemporary issues relevant to students' lives in the 21st century. Credit not granted for both HISTORY 105 and 305.

110 [HUM] American History to 1877 3 Social, economic, cultural history of British mainland colonies/United States to 1877.

111 [HUM] American History Since 1877 3 Social, economic, cultural history of United States, 1877 to present.

120 [DIVR] World History I 3 Integrated study of political, social, cultural, economic, environmental and religious systems among peoples and civilization prior to 1500 CE.

121 [HUM] World History II 3 Integrated study of political, social, cultural, economic, environmental and religious systems among peoples and civilization after 1500 CE.

130 [DIVR] History of Organized Crime in America 3 Role and impact of the rise of organized crime in the United States.

150 [DIVR] Peoples of the United States 3 Examination of the peoples of the United States from the beginnings of the colonial era to the present.

201 Asian Pacific American History 3 Historical experience of Asian/Pacific Americans since the 19th century. (Crosslisted course offered as CES 211, HISTORY 201).

216 Introduction to American Cultural Studies 3 Introduction to the interdisciplinary study of American cultures and the field of American studies. (Crosslisted course offered as AMER ST 216, ENGLISH 216, HISTORY 216, WOMEN ST 216).

- 230 [HUM] Latin America, The Colonial Period** 3 Overview of the most significant events, social and ethnic groups, practices, and institutions of colonial Latin America.
- 231 [HUM] Latin America, The National Period** 3 Analysis of challenges faced by Latin America in nation-building after independence throughout the nineteenth century, through case studies.
- 235 [HUM] African American History** 3 History of African Americans in the US with emphasis upon major themes of the Black experience. (Crosslisted course offered as CES 235, HISTORY 235, WOMEN ST 235).
- 270 [DIVR] India: History and Culture** 3 Survey of South Asian history, societies and cultures - development of civilization and contemporary societies of India and South Asia. (Crosslisted course offered as HISTORY 270, ASIA 270).
- 271 [DIVR] Southeast Asian History: Vietnam to Indonesia** 3 Historical introduction to Southeast Asian social, religious, political, economic and cultural institutions including Vietnam, Thailand, Burma, the Philippines and Indonesia. (Crosslisted course offered as HISTORY 271, ASIA 271).
- 272 [DIVR] Introduction to Middle Eastern History** 3 History of the Middle East from Muhammad to the present; political and religious development and the impact of empires. (Crosslisted course offered as HISTORY 272, ASIA 272).
- 273 [DIVR] Foundations of Islamic Civilization** 3 Islamic civilization presented through the main ideas, institutions and cultural forms; Golden Age of Islam and Muslim contributions to world civilizations. (Crosslisted course offered as HISTORY 273, ASIA 273).
- 274 [DIVR] Introduction to African History** 3 Survey of the history of Africa from human origins to present.
- 275 [DIVR] Introduction to East Asian Culture** 3 Survey of East Asia (China, Japan, Korea, and others) history from 1766 BCE to the present. (Crosslisted course offered as HISTORY 275, ASIA 275).
- 280 Race and the Law in American History** 3 Introduction to the role of the law in American race-relations since 1750. (Crosslisted course offered as CES 280, HISTORY 280).
- 298 [DIVR] History of Women in American Society** 3 Exploration of the many roles women have played in American society from the Colonial period through the twentieth century. (Crosslisted course offered as HISTORY 298, WOMEN ST 298).
- 300 [M] Writing about History** 3 Course Prerequisite: Certified major in History; sophomore standing. Historical topics, use of sources, analytical thought, and precision in language.
- 305 [ROOT] Roots of Contemporary Issues For Transfer Students** 3 Course Prerequisite: Junior standing. Historical roots of global contemporary issues relevant to students' lives in the 21st century. Credit not granted for both HISTORY 105 and 305.
- 306 Cultures and Peoples of the Middle East** 3 Contemporary Arab cultures in a historical perspective within the framework of Western-Middle Eastern relations. (Crosslisted course offered as ANTH 306, ASIA 306, HISTORY 306).
- 308 [DIVR] North American Indian History, Precontact to Present** 3 Traces American Indians from precontact to the present against the backdrop of sovereignty, treaty rights, and trust responsibility. Cooperative: Open to UI degree-seeking students.
- 313 [SSCI] Black Freedom Struggle** 3 Historic exploration of black resistance focusing on nationwide movement that developed following World War II. (Crosslisted course offered as CES 335, HISTORY 313).
- 314 [DIVR] American Roots: Immigration, Migration, and Ethnic Identity** 3 An analysis of immigration to migration within the US including political and social consequences and the experiences of ethnic groups since the early 19th century.
- 315 Poverty and Policy in American History** 3 Course Prerequisite: Junior standing. Poverty in America and attempts to ameliorate it including race/ gender and poverty and poverty policy.
- 319 Geographical History of the US** 3 Perspectives on the geographical history of the U.S. from early times to the present.
- 321 [DIVR] US Popular Culture, 1800 to 1930** 3 Sports, early movies and radio, vaudeville, minstrel shows, circuses, Wild West shows, music, and other popular arts in historical context.
- 322 [DIVR] US Popular Culture Since 1930** 3 Movies, radio, television, sports, music, and other popular arts in historical context.
- 326 Abraham Lincoln and the Lincoln Legacy** 3 Broad overview of the life, presidency and legacy of Abraham Lincoln.
- 331 [HUM] Latin American Cultural History** 3 Analysis of the contact between Native Americans, Europeans, Africans, and others and the cultural ramifications that have ensued.
- 335 [DIVR] Women in Latin American History** 3 Survey of women's changing roles throughout Latin America from pre colonial to present. (Crosslisted course offered as HISTORY 335, WOMEN ST 335).
- 336 History of Sexualities** 3 Historical analysis of the social construction of sexualities in intersection with race and class within national and transnational contexts. (Crosslisted course offered as WOMEN ST 336, HISTORY 336).
- 337 Women in the Ancient World** 3 Role of women in ancient Egypt, Mesopotamia, Israel, Greece, and Rome; focus on the formation of western attitudes toward women.
- 340 Ancient Greece** 3 History and culture of pre Christian GREEK civilization.
- 341 Rome: Republic and Empire** 3 History and culture of the Roman world from the independence of the city to the onset of the medieval order.
- 342 History of England to 1485** 3 English history; intellectual and cultural development.
- 350 European Women's History, 1400-1800** 3 Women's experiences in Europe from the Renaissance to the Enlightenment and the ideas and roles that shaped their opportunities. (Crosslisted course offered as HISTORY 350, WOMEN ST 350).
- 355 [HUM] History of European Popular Culture** 3 The transformation of Europe's popular culture (music, games, stories, beliefs) through social, religious, print, and industrial revolutions.
- 370 History of Ancient and Medieval India** 3 Historical development to 1500 CE of states, religions, caste society, gender customs and social ecology in India. (Crosslisted course offered as HISTORY 370, ASIA 370).
- 373 [HUM] Chinese Civilization** 3 Growth of Chinese civilization from the Bronze Age to the present. (Crosslisted course offered as HISTORY 373, ASIA 373).
- 374 [HUM] Japanese Civilization** 3 Overview of Japanese history from the Stone Age to the present, including political, social, economic, and cultural history. (Crosslisted course offered as HISTORY 374, ASIA 374).
- 381 Science in Western Civilization Through Newton** 3 Development of Western science and its influence on European culture and society.
- 382 [HUM] History of Science and Technology Since Newton** 3 Development of modern science and its influence on Western culture and society.
- 386 World War II in Europe** 3 Causes for war; military operations; economic mobilization; social and cultural change; occupation and resistance; the Holocaust; the legacy of war.
- 387 World War II in Asia and the Pacific** 3 Imperial rivalries in Asia; Japanese militarism; military, ideological and social aspects of the war; the atomic bomb; memory of the war. (Crosslisted course offered as HISTORY 387, ASIA 387).
- 388 US and Vietnam** 3 Course and consequences of US involvement in Indo-China, focusing on the causes and conduct of the US Vietnam conflict from 1945-1997.
- 390 U.S. Military History** 3 American military history from 1630 to the present. Themes will include civil military relations, the conduct of war, and political-military relations.
- 395 Topics in History** 3 May be repeated for credit; cumulative maximum 6 hours. Analytical study of selected historical movements and events. Cooperative: Open to UI degree-seeking students.

- 396 Topics in African History** 3 May be repeated for credit; cumulative maximum 9 hours. Analytical study of selected African historical movements and events.
- 398 [DIVR] History of Women in the American West** 3 The multicultural history of women in the west through women's literature, archives, and oral history. (Crosslisted course offered as HISTORY 398, WOMEN ST 398).
- 399 [DIVR] Lesbian and Gay History: Culture, Politics and Social Change in the US** 3 History and theory of same-sex sexuality in the United States including identity formation, community development, politics and culture. (Crosslisted course offered as HISTORY 399, WOMEN ST 399).
- 400 History in Media** 3 Representation of historical people and events through different media e.g., text, film, video, and computers.
- 407 Religion and American Culture** 3 American religions from pre-contact times to the present focusing on the evolution of religious faiths.
- 409 [CAPS] American Environmental History** 3 Course Prerequisite: Junior standing. A history of environmental change, ideas of nature, natural resource development, conservation politics, science and environmental policy.
- 410 History of American Indian Sovereignty and Federal Indian Law** 3 The history of sovereignty and Federal Indian Law against the backdrop of treaties and trust responsibility. (Crosslisted course offered as HISTORY 410, ANTH 410, POL S 410).
- 411 American Diplomatic History, 1776-1914** 3 Policies and principles characteristic of American diplomacy from 1776 to 1914. Credit not granted for both HISTORY 411 and HISTORY 511.
- 412 American Diplomatic History in the 20th Century** 3 Credit not granted for both HISTORY 412 and HISTORY 512.
- 413 [M] Early American History to 1750** 3 The cultures and interactions of Native Americans, Europeans, and Africans; development of colonial American societies and institutions.
- 414 The Era of the American Revolution** 3 The origins of the American Revolution, the War of Independence, and the emergence of republican government and society.
- 415 Jeffersonian-Jacksonian America** 3 Social and political history of the United States from 1789 to 1845; Jeffersonian and Jacksonian eras. Credit not granted for both HISTORY 415 and HISTORY 515.
- 416 Civil War and Reconstruction** 3 The Civil War as a problem in historical causation and social, political, and economic impact of the war. Credit not granted for both HISTORY 416 and HISTORY 516.
- 417 [CAPS] Rise of Modern America** 3 Course Prerequisite: Junior standing. Major historical and cultural developments, issues, interpretations, and debates of importance during the Gilded Age and Progressive Era.
- 418 [HUM] United States, 1914-1945** 3 America through World War I, cultural tensions of the Twenties, and the crises of Depression and WWII.
- 419 [HUM] United States, 1945-Present** 3 International and domestic impact of the Cold War, era of McCarthyism, American aspirations, tensions and conflicts in the post-industrial era. Credit not granted for both HISTORY 419 and HISTORY 519.
- 421 The American West** 3 Multicultural exploration of the frontier experience and western America; environment, economic development, gender, class and race emphasized. Credit not granted for both HISTORY 421 and HISTORY 521.
- 422 History of the Pacific Northwest** 3 Political, social economic and environmental history of the Pacific Northwest. Fulfills the teaching certification requirement for Washington state history. Credit not granted for both HISTORY 422 and HISTORY 522.
- 423 Radicals, Reformers, and Romantics: The Impact** 3 Changing thought and its impact in the United States from colonial times to the present. Credit not granted for both HISTORY 423 and HISTORY 523.
- 425 The City in History** 3 Course Prerequisite: Junior standing. Description and comparison of the city through history in European and one or more non-Western cultures.
- 426 Workers Across North America** 3 Course Prerequisite: Junior standing. International interactions between workers and labor unions in Mexico, Canada and the US. (Crosslisted course offered as CES 426, HISTORY 426).
- 427 [M] Public History: Theory and Methodology** 3 An introduction to the broad range of non-traditional careers in history. Credit not granted for both HISTORY 427 and HISTORY 527. Cooperative: Open to UI degree-seeking students.
- 430 [M] History of Mexico** 3 War of independence, 19th century Mexico and the liberal-conservative struggle; modern Mexico since the Revolution of 1910. Credit not granted for both HISTORY 430 and HISTORY 530.
- 432 [HUM] 20th Century Latin America** 3 Contemporary history of Latin America, analyzing political, economic, social, and cultural history through a thematic, comparative approach. Credit not granted for both HISTORY 432 and HISTORY 532.
- 433 History of Cuba and the Caribbean** 3 Historical development of the Caribbean, with emphasis on Cuba, from the Spanish arrival to Castro's revolution.
- 434 Revolution in Latin America** 3 Social and political development in Central America; reasons for dictatorships and revolutionary movements; comparison with other Latin American regions.
- 435 [CAPS] European Expansion Overseas, 1400-1800** 3 Course Prerequisite: Junior standing. The factors underlying European overseas expansion before 1800 and its impact on indigenous societies and world trading patterns.
- 436 [CAPS] Imperialism in the Modern World** 3 Course Prerequisite: Junior standing. History of imperialism (colonial, economic, territorial, cultural) since 1800 as a global phenomenon.
- 438 Topics in Public History** V 1-3 May be repeated for credit; cumulative maximum 3 hours. Public history applications, methods and careers in specific public history fields.
- 439 Slavery, Abolition and Emancipation in World History** 3 Course Prerequisite: Junior standing. History of slavery and abolition as a world-wide phenomena; trends and debates in historiographical literature. Credit not granted for both HISTORY 439 and HISTORY 539.
- 440 [HUM] The Early Middle Ages, 330-1050** 3 Western Europe, the Byzantine Empire, and Islam from the dissolution of classical Roman civilization to the 11th century revival.
- 441 The Later Middle Ages, 1050-1500** 3 Western European and Byzantine civilizations from the 11th century revival to the advent of the Renaissance in the West.
- 444 [CAPS] The Renaissance** 3 Course Prerequisite: Junior standing. Political, cultural, and religious history of Europe, 1300-1500.
- 445 The Reformation** 3 Political, cultural, and religious history of Europe, 1500-1650.
- 447 Europe in the French Revolutionary and Napoleonic Era, 1789 to 1815** 3 Credit not granted for both HISTORY 447 and HISTORY 547.
- 448 Modern Europe as Reflected In Art** 3 Early Modern Europe as reflected in architecture and the visual arts.
- 449 Europe and Two World Wars, 1914-1945** 3 Political, intellectual, economic, and international aspects of European life during and between two world wars. Credit not granted for both HISTORY 449 and HISTORY 549.
- 450 [HUM] [M] Europe Since 1945** 3 Course Prerequisite: Junior standing. Europe from the end of World War II to the present; the Cold War, European integration, the fall of communism, social and intellectual life. Credit not granted for both HISTORY 450 and HISTORY 550.
- 453 Age of Revolution: Europe, 1815-1871** 3 The consolidation of industrial society and the nation-state in 19th-century Europe. Credit not granted for both HISTORY 453 and HISTORY 553.
- 454 Age of Empire: Europe, 1871-1914** 3 The rise of Europe to world predominance and the crisis of the European order. Credit not granted for both HISTORY 454 and HISTORY 554.
- 455 The Great War 1914 - 1920** 3 Political, social and cultural history of the first global war from the Sarajevo assassination through the post-war peace settlements.

- 459 Modern Britain** 3 Britain and the Empire from the Napoleonic wars to the present. Credit not granted for both HISTORY 459 and HISTORY 559.
- 462 History of Imperial Russia** 3 History and culture of Imperial Russia from Peter the Great to the 1905 revolution. (Crosslisted course offered as HISTORY 462, RUSSIAN 462).
- 463 [M] History of the Soviet Union** 3 The Russian revolutions and the Soviet regime: 1905 to the present. (Crosslisted course offered as HISTORY 463, RUSSIAN 463).
- 464 Comparative Genocide** 3 Course Prerequisite: Junior standing. Study of the concepts, history, and consequences of genocide in the global perspective through theoretical and case study analysis. Credit not granted for both HISTORY 464 and HISTORY 564.
- 466 History of the Cold War, 1944-present** 3 Course Prerequisite: Junior standing. Exploration of the 50 year cold conflict between the US and USSR and its political, social, economic, and cultural consequences for the world.
- 467 Modern France** 3 The history of France from the revolution of 1789 to the present. Credit not granted for both HISTORY 467 and HISTORY 567.
- 468 Hitler and Nazi Germany** 3 Origins and rise of Nazism; state, society and culture in the Third Reich; Nazi racial ideology; world war; the Holocaust. Credit not granted for both HISTORY 468 and HISTORY 568.
- 469 [M] Seminar in History** 3 May be repeated for credit. Course Prerequisite: HISTORY 300 with a C or better; certified major in History.
- 472 [M] The Middle East Since World War I** 3 Course Prerequisite: Junior standing. Developments in the Middle East since World War I including nationalism, fundamentalism, and revolution. (Crosslisted course offered as HISTORY 472, ASIA 472).
- 473 The Middle East and the West** 3 East-west tensions in the context of historical relations between the Middle East and West Europe since the rise of Islam. (Crosslisted course offered as HISTORY 473, ASIA 473).
- 474 [CAPS] Modern South Asia: Community and Conflict** 3 Course Prerequisite: Junior standing. Historical transformation of communities and communal conflicts in modern South ASIA from 1500 to present; themes: caste, religion, geography, environment and economy. (Crosslisted course offered as HISTORY 474, ASIA 474).
- 475 Mao to Deng: The People's Republic of China, 1949 - Present** 3 The major political, social, economic and cultural developments during the People's Republic of China. (Crosslisted course offered as HISTORY 475, ASIA 475, POL S 475).
- 476 [M] Revolutionary China, 1800 to Present** 3 Continuity and change in the political, social, cultural and economic experience of China since 1800. (Crosslisted course offered as HISTORY 476, ASIA 476, POL S 476).
- 477 [DIVR] [M] Modern Japanese History** 3 Examination of political, socioeconomic and cultural changes and the international crises in modern Japan since the 19th century. (Crosslisted course offered as HISTORY 477, ASIA 477). Credit not granted for both HISTORY 477 and HISTORY 577.
- 479 History of East Asian Economic Development Since 1945** 3 The historical relationships between politics and economics in East Asian since 1945. (Crosslisted course offered as HISTORY 479, ASIA 479).
- 480 Methods of Teaching Social Studies** 3 Course Prerequisite: Certified major in History or Social Studies. Methods, resources, selection of content, past and present issues in social studies education.
- 483 [CAPS] Medicine, Science, and Technology in World History** 3 Course Prerequisite: Junior standing. The emergence of modern technological society with emphasis on scientific development and exchange among world civilizations across history.
- 486 United States Foreign Relations** 3 Ends and means in foreign policy; organization, management, control, and current policy issues. (Crosslisted course offered as POL S 427, HISTORY 486).
- 491 History of World Trade** 3 Course Prerequisite: Junior standing. The evolution of the institutions, conditions, and consequences of world trade after 1000.
- 492 [CAPS] Cultural Appetites: Food in World History** 3 Course Prerequisite: Junior standing. What food selection and preparation reveals about cultural integration around the world from the medieval era to the present.
- 494 Global Environmental History** 3 Historical dynamics of human communities and their ecological settings.
- 495 [CAPS] Space, Place, and Power in History: Historical Geography in Global Perspective** 3 Course Prerequisite: Senior standing. Introduction to the discipline of historical geography; geographical and spatial approaches to European, North American, and Asian history.
- 497 Seminar** 3 May be repeated for credit; cumulative maximum 6 hours.
- 498 History Internship** V 1-12 May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: Certified major or minor in History. Participation as intern in public or private sectors. Credit not granted for both HISTORY 498 and HISTORY 598.
- 499 Special Problems** V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 509 Field Course: Foundations in US History** 3 May be repeated for credit; cumulative maximum 12 hours. Chronological readings in US history.
- 510 Field Course in American History** 3 May be repeated for credit. Readings and interpretive problems of American history.
- 511 American Diplomatic History, 1776-1914** 3 Policies and principles characteristic of American diplomacy from 1776 to 1914. Credit not granted for both HISTORY 411 and HISTORY 511.
- 512 American Diplomatic History in the 20th Century** 3 Credit not granted for both HISTORY 412 and HISTORY 512.
- 515 Jeffersonian-Jacksonian America** 3 Social and political history of the United States from 1789 to 1845; Jeffersonian and Jacksonian eras. Credit not granted for both HISTORY 415 and HISTORY 515.
- 516 Civil War and Reconstruction** 3 The Civil War as a problem in historical causation and social, political, and economic impact of the war. Credit not granted for both HISTORY 416 and HISTORY 516.
- 519 [HUM] United States, 1945-Present** 3 International and domestic impact of the Cold War, era of McCarthyism, American aspirations, tensions and conflicts in the post-industrial era. Credit not granted for both HISTORY 419 and HISTORY 519.
- 520 Field Course in the American West** 3 May be repeated for credit; cumulative maximum 9 hours. Readings and interpretive problems in the history of the American West.
- 521 The American West** 3 Multicultural exploration of the frontier experience and western America; environment, economic development, gender, class and race emphasized. Credit not granted for both HISTORY 421 and HISTORY 521.
- 522 History of the Pacific Northwest** 3 Political, social economic and environmental history of the Pacific Northwest. Fulfills the teaching certification requirement for Washington state history. Credit not granted for both HISTORY 422 and HISTORY 522.
- 523 Radicals, Reformers, and Romantics: The Impact** 3 Changing thought and its impact in the United States from colonial times to the present. Credit not granted for both HISTORY 423 and HISTORY 523.
- 524 Seminar in the American West** 3 May be repeated for credit; cumulative maximum 9 hours. Research seminar in the history of the American West.
- 525 Seminar in American History** 3 May be repeated for credit. Cooperative: Open to UI degree-seeking students.
- 527 [M] Public History: Theory and Methodology** 3 An introduction to the broad range of non-traditional careers in history. Credit not granted for both HISTORY 427 and HISTORY 527. Cooperative: Open to UI degree-seeking students.
- 528 Seminar in Public History** 3 May be repeated for credit; cumulative maximum 6 hours. The development of skills at the graduate level to be used in nontraditional careers for historians.

- 529 Interpreting History through Material Culture** 3 May be repeated for credit; cumulative maximum 6 hours. Historical interpretation to work on major historic preservation and museum projects.
- 530 [M] History of Mexico** 3 War of independence, 19th century Mexico and the liberal-conservative struggle; modern Mexico since the Revolution of 1910. Credit not granted for both HISTORY 430 and HISTORY 530.
- 532 [HUM] 20th Century Latin America** 3 Contemporary history of Latin America, analyzing political, economic, social, and cultural history through a thematic, comparative approach. Credit not granted for both HISTORY 432 and HISTORY 532.
- 535 Field Course in Latin American History** 3 May be repeated for credit; cumulative maximum 9 hours. Readings and interpretive problems in Latin American history.
- 539 Slavery, Abolition and Emancipation in World History** 3 History of slavery and abolition as a world-wide phenomena; trends and debates in historiographical literature. Credit not granted for both HISTORY 439 and HISTORY 539.
- 540 Seminar in History** 3 May be repeated for credit.
- 547 Europe in the French Revolutionary and Napoleonic Era, 1789 to 1815** 3 Credit not granted for both HISTORY 447 and HISTORY 547.
- 549 Europe and Two World Wars, 1914-1945** 3 Political, intellectual, economic, and international aspects of European life during and between two world wars. Credit not granted for both HISTORY 449 and HISTORY 549.
- 550 [HUM] [M] Europe Since 1945** 3 Europe from the end of World War II to the present; the Cold War, European integration, the fall of communism, social and intellectual life. Credit not granted for both HISTORY 450 and HISTORY 550.
- 553 Age of Revolution: Europe, 1815-1871** 3 The consolidation of industrial society and the nation-state in 19th-century Europe. Credit not granted for both HISTORY 453 and HISTORY 553.
- 554 Age of Empire: Europe, 1871-1914** 3 The rise of Europe to world predominance and the crisis of the European order. Credit not granted for both HISTORY 454 and HISTORY 554.
- 559 Modern Britain** 3 Britain and the Empire from the Napoleonic wars to the present. Credit not granted for both HISTORY 459 and HISTORY 559.
- 560 Field Course in Early European History** 3 May be repeated for credit; cumulative maximum 9 hours. Readings and issues in early European history.
- 561 Field Course in Early Modern European History** 3 Readings and interpretive problems in early modern European history (1450 - 1750).
- 563 [M] History of the Soviet Union** 3 The Russian revolutions and the Soviet regime: 1905 to the present. (Crosslisted course offered as HISTORY 463, RUSSIAN 463).
- 564 Comparative Genocide** 3 Study of the concepts, history, and consequences of genocide in the global perspective through theoretical and case study analysis. Credit not granted for both HISTORY 464 and HISTORY 564.
- 567 Modern France** 3 The history of France from the revolution of 1789 to the present. Credit not granted for both HISTORY 467 and HISTORY 567.
- 568 Hitler and Nazi Germany** 3 Origins and rise of Nazism; state, society and culture in the Third Reich; Nazi racial ideology; world war; the Holocaust. Credit not granted for both HISTORY 468 and HISTORY 568.
- 569 Field Course in Modern European History** 3 May be repeated for credit; cumulative maximum 9 hours. Readings and interpretive problems in modern European history. Cooperative: Open to UI degree-seeking students.
- 570 World History Theory and Methods** 3 May be repeated for credit; cumulative maximum 9 hours. Historiographic overview of the field of world history.
- 571 Topics in World History** 3 May be repeated for credit; cumulative maximum 6 hours. Readings in themes and literature of a global approach to history.
- 572 [M] The Middle East Since World War I** 3 Developments in the Middle East since World War I including nationalism, fundamentalism, and revolution. (Crosslisted course offered as HISTORY 472, ASIA 472).
- 573 Field Course in African History** 3 May be repeated for credit; cumulative maximum 6 hours. Readings and interpretive problems in African history.
- 575 Field Course in Women's History** 3 May be repeated for credit; cumulative maximum 6 hours. Readings and interpretive problems in women's history.
- 577 [DIVR] [M] Modern Japanese History** 3 Examination of political, socioeconomic and cultural changes and the international crises in modern Japan since the 19th century. (Crosslisted course offered as HISTORY 477, ASIA 477). Credit not granted for both HISTORY 477 and HISTORY 577.
- 578 Field Course in Asian History** 3 May be repeated for credit; cumulative maximum 9 hours. Readings and interpretive problems in Asian history.
- 580 Historiography** 3
- 595 The Teaching of History in College** 3 Theory, problems, and methods of teaching history at the college level.
- 596 Topics in American Studies** 3 May be repeated for credit; cumulative maximum 9 hours. American Studies Summer Institute. (Crosslisted course offered as AMER ST 596, HISTORY 596).
- 597 Seminar in History** V 2-3 May be repeated for credit.
- 598 History Internship** V 1-12 May be repeated for credit; cumulative maximum 12 hours. Participation as intern in public or private sectors. Credit not granted for both HISTORY 498 and HISTORY 598.
- 599 History Colloquium** 1 May be repeated for credit; cumulative maximum 4 hours. Weekly discussions and presentations on historical topics or current faculty and graduate student research. S, F grading.
- 600 Special Projects or Independent Study** V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination** V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 702 Master's Special Problems, Directed Study, and/or Examination** V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.
- 800 Doctoral Research, Dissertation, and/or Examination** V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the History PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

The Honors College

honors.wsu.edu
Honors Hall 130
509-335-4505

M. Grant Norton, Dean.

The mission of the Honors College is to offer students of high ability and initiative an enriched, four-year core curriculum that satisfies university graduation requirements and promotes global competencies. The Honors College helps students develop genuine intellectual curiosity and a life-long love of learning through a series of courses and independent work. Honors students acquire the broad foundations of liberal learning in the natural and social sciences,

the arts and humanities, and cultures of the world. In addition, the Honors College requires competency in foreign language and encourages education abroad as premier vehicles for acquiring key competencies for an increasingly globalized society and economy.

Student Learning Outcomes

Honors College undergraduates understand the importance of becoming citizens of the world. They engage in multiple leadership opportunities, pursue research projects that result in a thesis or creative project, and often participate in an international educational experience. Their Honors curriculum emphasizes skills that help them achieve excellence, both within their major as well as their Honors coursework. As stated on our website, <http://honors.wsu.edu/academics/HCLearninggoalsoutcomes2012/> students in the Honors College commit to the following learning outcomes as they pursue higher education at WSU: critical and creative thinking, communication, information literacy, scientific literacy, quantitative and symbolic reasoning, cultural competency, and integration of knowledge.

Specifically, as a general education program, the Honors College expects that its graduates will be able to: (1) construct a reasoned and evidence-based position on an issue that takes into account their own and others' views; (2) use the library catalog, databases, and the Internet to find relevant information while critically evaluating the quality of those information resources; (3) demonstrate respect for different cultural systems and traditions and their contributions to society; (4) choose the appropriate methodology and theoretical framework to solve a problem or answer a question in their discipline; (5) write and speak effectively in different contexts for a variety of audiences; (6) learn to apply quantitative tools and draw conclusions; and (7) demonstrate competency in a foreign language.

Courses offered through the Honors College are open only to students enrolled in the program. For admissions, see the Honors College section of the catalog.

Honors College Requirements

A bachelor's degree earned through the Honors College requires approximately the same number of total semester hours as required by the University Common Requirements (UCORE). Students who complete the Honors College requirements are not required to complete the University Common Requirements for graduation. Students who transfer from Honors without completing the Honors College requirements will be responsible for fulfilling the UCORE.

Honors College students are required to complete the courses specified in the schedule of studies. The mathematics requirement for students in the Honors College can be met in a number of ways (see footnote 1). In addition, students complete a three-credit Honors Thesis in the junior or senior year. A few majors will fulfill this requirement through design projects in their field. Each student must choose a thesis advisor, complete a significant piece of writing, and make a public presentation. Students who present an outstanding thesis may receive a "Pass with Distinction" on their final transcript. The Honors Certificate of Global Competencies requires a thesis with an international topic. In addition,

students must participate in a study abroad experience and complete at least six credits while abroad. Students can also demonstrate competency by completing a foreign language through the 204 level.

The Honors College requires its students to demonstrate competency in a foreign language. With sufficient high school preparation, students can elect to take an online examination upon entrance to the Honors College. If additional preparation in a foreign language is necessary, students will work with an Honors advisor to develop an appropriate course of study.

For continued enrollment in the Honors College, students must maintain a minimum 3.2 cumulative GPA. Any graded courses used to fulfill Honors College graduation requirements must receive a grade of C or better. Successful completion of the Honors College requires that students fulfill the Honors Curriculum and have a cumulative GPA of 3.2 or better.

Each semester, students enrolled in the Honors College take one to two Honors courses in addition to their major courses. Honors College requirements and recommended timeline are listed below:

First Year

- ENGLISH 128
- Math requirement¹
- Foreign Language competency requirement²
- [BSCI] or [PSCI] with lab

Second or Third Year

- HONORS 270 Principles and Research Methods in Social Sciences³
- HONORS 280 Contextual Understanding in the Arts and Humanities
- HONORS 290 Science as a Way of Knowing⁴

Third or Fourth Year

- HONORS 370 Case Study: Global Issues in Social Science or 3 credits ED ABRD 991.
- HONORS 380 Case Study: Application of Arts and Humanities to Global Issues or 3 credits ED ABRD 992.
- HONORS 390 Case Study: Application of Science to Global Issues or 3 credits ED ABRD 993.
- HONORS 450 Honors Thesis⁵

Optional Coursework:

- HONORS 398 Honors Thesis Proposal Seminar
- HONORS 430 (Education Abroad Practicum and Research)

¹Students who qualify for Calculus II (MATH 172 or 182) on the basis of their math placement test receive credit for MATH 171 and thereby fulfill this requirement. Other students take the math required by their major. Honors College accepts: MATH 105, 140, 171, 202, 205, 206, 212, 251 and 252 combined, and 273 or 283. Check with an Honors College advisor for any questions concerning the math requirement.

²Assessed proficiency in a second language at the intermediate level or completion of a foreign language through the 204 level. May be completed at any time before graduation. Check with an Honors advisor for specifics. Education Abroad is strongly recommended for language acquisition. The following foreign language level courses in any language will be accepted as meeting the foreign

language competency standard set by the Honors College: 204, 261, 306, 307, and 308.

³ECONS 198 is an approved substitute for this requirement.

⁴Approved substitutes for this course include: CHEM 116, MATH 182, PHYSICS 205 or 206.

⁵Three credits required. HONORS 398 strongly recommended as preparation. Approved substitutes for this course include: BIO ENG 411, CE 465, CHE 451, CPT S 422, ENGR 421, E E 415, 416, and ME 416.

Certificates

Honors Certificate of Global Competencies

The Certificate of Global Competencies is an elective certificate for Honors students whose international interests and/or career objectives can be enhanced by an integrated program of language study, academic coursework, and study abroad. Students receive a notation on their transcript IN ADDITION to the Honors Certificate of Completion. The Certificate of Global Competencies builds on the courses required for the Honors Certificate of Completion. Students who enter with good foreign language preparation usually will not require extra time to complete both certificates. Fifteen graded credits are required for the Certificate of Global Competencies. A grade of C or better must be earned in each of the required, elective and transfer courses in order to qualify for the certificate. The university undergraduate certificate fee will apply. Students are strongly encouraged to work with an Honors advisor to plan an appropriate schedule of studies. The certificate entails requirements in four areas: 1. Foreign language competence: 3-6 graded credits at the 204 level or higher. 2. Education abroad: 6-9 graded credits from one term abroad or longer in an approved program. A "term" may include a summer session with a full academic load. A typical semester abroad in an approved program will result in 12-15 WSU credits. 3. HONORS 430 and presentation (3-6 credits, graded): May be completed through coursework abroad or at WSU. HONORS 430 includes an oral presentation scheduled at the Honors College during the first semester following the completion of HONORS 430. 4. Honors Thesis (HONORS 450, 3 credits, S,F): Your Honors Thesis must incorporate an international perspective significantly developed in the thesis. See an Honors advisor for approval of the international component.

Description of Courses

UNIVERSITY HONORS

BIOLOGY 298 – Honors Biology for Non-Science Majors

CHEM 116 – Chemical Principles Honors II

ECONS 198 – Economics Honors

ENGLISH 298 – Writing and Research Honors

MATH 182 – Honors Calculus II

MATH 230 – Honors Introductory Linear Algebra

MATH 283 – Honors Calculus III

PHYSICS 205 – Physics Honors I

PHYSICS 206 – Physics Honors II

- see Honors College courses below -

HONORS

198 Honors First-Year Experience 1 Course
Prerequisite: Must be an Honors student.
Making a successful transition to college including advising, schedule planning and undergraduate research opportunities. S, F grading.

270 Principles and Research Methods in Social Science 3 Course Prerequisite: Must be an Honors student. Scholarship in social sciences; exposure to theoretical frameworks.

280 Contextual Understanding in the Arts and Humanities 3 Course Prerequisite: Must be an Honors student. Scholarship in the arts/humanities; exposure to theoretical frameworks.

290 Science as a Way of Knowing 3 Course
Prerequisite: Must be an Honors student; any B, BSCL, P, PSCI, or SCI lab or concurrent enrollment. Exploration of how scientific knowledge is acquired, refined and advanced; hands-on experience with scientific scholarship. Recommended preparation: For science or engineering majors.

301 University Scholars Lecture Series 1 May be repeated for credit; cumulative maximum 3 hours. Course Prerequisite: Must be an Honors student. Themed lecture series and discussion seminar.

370 Case Study: Global Issues in Social Sciences 3 Course Prerequisite: Must be an Honors student; HONORS 270 or ECONS 198. Using research skills to analyze a global case study or international perspective in the social sciences.

380 Case Study: Global Issues in the Arts and Humanities 3 Course Prerequisite: Must be an Honors student; HONORS 280. Using research skills to analyze a global case study or international perspective in the arts/humanities.

390 Case Study: Global Issues in the Sciences 3 Course Prerequisite: Must be an Honors student; HONORS 290, SCIENCE 299, CHEM 116, MATH 182, PHYSICS 205, or PHYSICS 206. Using research skills to analyze a global case study or international perspective in the sciences.

398 Honors Thesis Proposal Seminar 1 Course
Prerequisite: Must be an Honors student; sophomore standing. Seminar to complete the honors thesis proposal for HONORS 450. S, F grading.

399 Honors Thesis Seminar 1 Course
Prerequisite: Must be an Honors student; HONORS 398. Seminar to complete honors thesis for HONORS 450. S, F grading.

430 Education Abroad Research V 1-4 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Must be an Honors student. Special assignments and research related to education abroad.

450 Honors Thesis or Project V 1-4 May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: Must be an Honors student. Thesis or project directed by student's major department. S, F grading.

499 Special Problems V 1-4 May be repeated for credit. Course Prerequisite: Must be an Honors student. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.

Department of Horticulture

horticulture.wsu.edu
Johnson Hall 149
509-335-9502

Regents Professor and Department Chair, B. W. Poovaiyah; Professors, K. M. Evans, J. K. Fellman, M. Keller, N. R. Knowles, D. R. Layne, V. I. Lohr, D. S. Main, C. A. Miles, P. P. Moore; Associate Professors, B. R. Bondada, L. K. Chalker-Scott, A. Dhingra, S. P. Ficklin, R. L. Hummel, S. Musacchi, N. C. Oraguzie, M. J. Pavek, C. P. Peace, M. D. Whiting; Assistant Professors, T. S. Collins, L. W. DeVetter, L. A. Kalcsits, M. M. Moyer; Adjunct/Affiliate Faculty, M. Ahmedullah, P. K. Andrews, L. R. Askham, C. Benedict, C. R. Brown, J. S. Cowan, E. A. Curry, J. R. Davenport, L. E. Hadwiger, I. Hanrahan, L. K. Hiller, W.M. Iritani, P. E. Jacoby, T. C. Koenig, F. E. Larsen, R. Maleike, J. P. Mattheis, J. R. McFerson, D. W. McMoran, K. D. Patten, M. E. Patterson, E. Proebsting, J. M. Roberts, D. R. Rudell, K. A. Scheke, L. E. Schrader, K. A. Struckmeyer, J. M. Tarara, R. E. Thornton, R. K. Thornton, T. D. Waters, M. J. Willett, C. Wohleb, W. H. Wolfe, Y. Zhu.

The Department of Horticulture offers programs of study leading to the degrees of Bachelor of Science in Integrated Plant Sciences, Bachelor of Science in Agricultural and Food Systems, Master of Science in Horticulture, Master of Science in Agriculture, Doctor of Philosophy in Horticulture, and Doctor of Philosophy in Molecular Plant Sciences. A minor in Horticulture is also available.

INTEGRATED PLANT SCIENCES AND AGRICULTURAL AND FOOD SYSTEMS

The science of plant life from molecule to market is the focus of the new Integrated Plant Sciences (IPS) Degree program. Delivered collaboratively by departments within the College of Agricultural, Human, and Natural Resource Sciences, the IPS degree provides students with an exciting depth and breadth of knowledge that crosses a variety of plant science disciplines, including crop and soil sciences, horticulture, landscape architecture, entomology, plant pathology, and food science. Students pursuing a Bachelor of Science degree in Integrated Plant Sciences may choose among seven majors highly sought by employers in the state, nationally, and internationally: Agricultural Biotechnology, Field Crop Management; Fruit and Vegetable Management; Landscape, Nursery, and Greenhouse Management; Landscape Design and Implementation; Turfgrass Management; or Viticulture and Enology. More information regarding IPS is available under the Integrated Plant Sciences catalog section and <http://ips.wsu.edu>.

The department is also involved with the College of Agricultural, Human and Natural Resource Sciences interdisciplinary Agricultural and Food

Systems Degree Program. The Agricultural and Food Systems (AFS) program is an exciting, college-wide, interdisciplinary program that offers a Bachelor of Science degree with five majors and a Master of Science degree. Majors available through AFS include Agricultural Technology and Production Management, Agricultural Education, Organic Agriculture Systems, Agricultural and Food Business Economics, and Agriculture and Food Security. More information regarding AFS is available under the Agricultural and Food Systems catalog section and <http://afs.wsu.edu>.

Students are encouraged to participate as part-time employees in research programs and seek professional internships for applied learning experiences. Departmental and college scholarships are available based on ability, need, and interest. Students gain professional and social contacts with the faculty and other students through student club activities, including Horticulture Club.

Agricultural Biotechnology

The Agricultural Biotechnology major is designed for students interested in careers such as laboratory or research technicians in plant biotechnology, breeding, genetics, entomology, plant pathology, molecular biology, or physiology, as well as for students preparing for advanced degrees in these areas. The program emphasizes the development and application of new technology to ensure a safe and abundant food and fiber supply. Students may find employment in industry, government, or university labs.

Fruit and Vegetable Management

The Fruit and Vegetable Management major offers specialization in the science and practice of growing, harvesting, handling, storing, processing, and marketing tree fruits, small fruits, and vegetables. Graduates can look forward to careers as growers and farm managers, production field advisors, sales representatives in the horticultural services industry, managers of produce firms, and brokers and marketers of fruit and vegetable products.

Landscape, Nursery, and Greenhouse Management

The Landscape, Nursery, and Greenhouse Management major is a horticulture-based program that prepares students for opportunities in plant propagation, the production and marketing of potted crops, bedding plants, trees, shrubs, and cut flowers, and in landscape plant management. This is an exciting major for students interested in owning or managing a nursery or greenhouse, attending graduate school in horticulture, working for university extension offices and research greenhouses, maintaining landscapes and parks, or working as wholesale horticultural-product brokers.

Viticulture and Enology

The Viticulture and Enology major was created for students interested in wine-grape growing and winemaking, as well as contributing to critical research and development opportunities in the wine industry. This program offers the technical, scientific, and practical experience needed to gain the essential skills for producing high quality grapes and premium table wines. It prepares students for successful careers in the wine industry in Washington and beyond.

Undergraduate Transfer Students

Students planning to transfer to Washington State University should take courses which meet the University Common Requirements (UCORE), and that meet the core requirements for Integrated Plant Sciences and Agricultural and Food Systems. Students are strongly encouraged to consult with an advisor within the Department of Horticulture for further guidance.

Preparation for Graduate Study

Preparation for graduate study requires the selection of courses that will benefit later work toward a Master of Science or a Doctor of Philosophy degree. Normally, preparation for an advanced degree in horticulture includes course work outlined under one of the majors with a strong emphasis in plant sciences, chemistry, environmental science, genetics, mathematics, and statistics.

LANDSCAPE ARCHITECTURE

Please see the School of Design and Construction in this catalog for information about Landscape Architecture.

Minors

Horticulture

A minimum of 16 hours in courses carrying a HORT subject is required, of which at least 9 hours must be in 300-400-level courses and taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. A maximum of 3 hours of the 16 hours may be from the following courses: HORT 399, 495, 499.

Viticulture and Enology

The minor in Viticulture and Enology requires at least 16 credit hours of course work, 9 of which must be in the 300-400 level and taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. The minor requires VIT ENOL 113, 313, and 422, and 7 additional credit hours from BIOLOGY 420, FS 460, HBM 350, PL P 300, SOIL SCI 201, or any VIT ENOL course - with the following exception: No more than 4 credits of VIT ENOL 399, 495, 496, or 499 may be used towards this minor. At least 3 of the 7 additional credits must be upper division. Courses not in the elective course list may be used with advisor approval.

Students interested in minoring in Viticulture and Enology should contact Cristie Crawford at Pullman, cristie.crawford@wsu.edu or 509-335-8406, or Lindsay Lightner at Tri-Cities, llightner@tricity.wsu.edu or 509-372-7366.

Description of Courses

HORTICULTURE

HORT

102 Introduction to Cultivated Plants 3
Exploring cultivated plant classification and morphology, crop reproduction, basic plant processes, and the biotic and abiotic factors which can influence these processes. (Crosslisted course offered as HORT 102, CROP SCI 102).

150 [BSCI] Science and Art of Growing Plants 4 (3-3) Understand and apply the science behind how plants grow and the art of growing plants for personal and commercial use.

202 Crop Growth and Development 4 (3-3) Course Prerequisite: HORT/ CROP SCI 102. Morphology, anatomy, growth and development of agronomic and horticultural crops. (Crosslisted course offered as HORT 202, CROP SCI 202).

310 Pomology 3 Course Prerequisite: BIOLOGY 106, BIOLOGY 107, BIOLOGY 120, or HORT 202. Botany, history, production, and uses of temperate-zone tree and small fruit crops. Cooperative: Open to UI degree-seeking students.

313 Viticulture 3 Course Prerequisite: BIOLOGY 106, BIOLOGY 107, BIOLOGY 120, or HORT 202. Botanical relationships, plant characteristics, fruiting habits, location, culture, marketing, and utilization of grapes, berries, and other small or bush fruits. Field trip required. (Crosslisted course offered as HORT 313, VIT ENOL 313). Cooperative: Open to UI degree-seeking students.

320 Olericulture 3 Science, business, and art of vegetable crop production: culture, fertility, growth, physiology, handling, marketing; garden, commercial, greenhouse, tropical, specialty vegetables. Recommended preparation: BIOLOGY 106, BIOLOGY 107, BIOLOGY 120, or HORT 202. Cooperative: Open to UI degree-seeking students.

321 Olericulture Laboratory 1 (0-3) Course Prerequisite: Concurrent enrollment in HORT 320. Production principles and practices of vegetable crops; plant characteristics, cultivars, nutrition, growth, and development. Field trip required. Cooperative: Open to UI degree-seeking students.

322 Fruit and Vegetable Harvesting and Processing Technology 3 (2-3) Course Prerequisite: MATH UCORE or MATH 107. Technologies for harvesting, handling, storing, processing, and packaging of value-added fruit and vegetable products. Field trip required.

326 Vineyard and Winery Equipment Systems 3 (2-3) Course Prerequisite: HORT 313. Overview of machinery systems used in vineyards and wineries. Field trip required. (Crosslisted course offered as HORT 326, VIT ENOL 326).

330 Landscape Plants for Urban and Community Environments 3 (2-3) Plants for solving problems in human-dominated landscapes: their characteristics, functions such as storm water management and climate change mitigation, ecology, identification, and selection. Recommended preparation: BIOLOGY 120 or HORT 202.

331 Landscape Plant Installation and Management 3 (2-3) Principles and practices for installation and management of interior and exterior landscapes; specifications, site preparation transplanting, growth control, problem diagnosis. Recommended preparation: BIOLOGY 106, BIOLOGY 107, BIOLOGY 120, HORT 202, HORT 231, or HORT 232.

332 Interior Plantscaping 3 Design, selection, installation, management, and maintenance of plantings within buildings; effects of interior plants on people and the environment. Recommended preparation: 3 hours BIOLOGY or HORT. Cooperative: Open to UI degree-seeking students.

346 Landscape Irrigation Systems 3 (2-3) System component selection; layout, installation, operation of irrigation systems for turf and landscape plantings; basic system hydraulics; efficient water use.

350 Food Systems in Western Washington 3 Course Prerequisite: CROP SCI/HORT 102; ECONS 101; SOIL SCI 201. Introduction to local and regional food systems unique to western Washington with an emphasis on the farm-to-table processes of foods and beverages. (Course offered as HORT 350, AFS 350).

351 (251) Plant Propagation 4 (3-3) Course Prerequisite: BIOLOGY 106, BIOLOGY 107, BIOLOGY 120, or HORT 202. Physiological and biochemical basis for sexual and asexual propagation of plants by seed, cutting, layering, grafting, budding, specialized plant structures and micropropagation. Field trip required.

357 Greenhouse Management and Crop Production 3 Importance of greenhouse structure and operational systems to quality plant production; production requirements for spring greenhouse crops. Recommended preparation: 3 hours BIOLOGY or HORT. Cooperative: Open to UI degree-seeking students.

358 Greenhouse Management and Crop Production Lab 1 (0-2) Course Prerequisite: Concurrent enrollment in HORT 357. Production practices for spring greenhouse crops. Cooperative: Open to UI degree-seeking students.

399 Professional Work Experience V 1 (0-3) to 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: Certified IPS major or by interview. Planned and supervised work experience. (Crosslisted course offered as HORT 399, VIT ENOL 399). S, F grading.

405 Ciders and Other Fermented Foods 3 (2-3) Course Prerequisite: FS 304; FS 465. Chemistry, microbiology, and technology associated with the production of cider, beer, and other food fermentations. Two half-day field trips required. (Crosslisted course offered as FS 405, HORT 405). Cooperative: Open to UI degree-seeking students.

409 Seminar in Viticulture and Enology 1 Current topics and recent developments in the field of viticulture and enology. (Crosslisted course offered as HORT 409, VIT ENOL 409).

413 Advanced Viticulture 3 Course Prerequisite: BIOLOGY 420; HORT 313; SOIL SCI 201. Wine and juice grape production in eastern Washington; wine and fruit physiology, climate and soils, and fruit quality. (Crosslisted course offered as HORT 413, VIT ENOL 413). Cooperative: Open to UI degree-seeking students.

- 416 Advanced Horticultural Crop Physiology** 3 Course Prerequisite: BIOLOGY 106, BIOLOGY 107, BIOLOGY 120, or HORT 202; junior standing. Physiological processes related to growth, development, and productivity of horticultural crops; advances in recombinant DNA technology; the impact on horticultural practices. Credit not granted for both HORT 416 and HORT 516. Recommended preparation: BIOLOGY 420.
- 418 [M] Post-harvest Biology and Technology** 3 (2-3) Course Prerequisite: BIOLOGY 420. Physical and physiological basis for handling and storage practices; perishable organ ontogeny and physiological disorders; post-harvest environment requirements. Field trip required. Credit not granted for both HORT 418 and HORT 518. Recommended preparation: HORT 202. Cooperative: Open to UI degree-seeking students.
- 421 Fruit Crops Management** 3 Course Prerequisite: 6 hours HORT, BIOLOGY, or VIT ENOL. Current research and management strategies for production and quality of temperate-zone fruit crops. Credit not granted for both HORT 421 and HORT 521. Recommended preparation: HORT 310 or HORT 313.
- 425 [CAPS] [M] Trends in Horticulture** 3 Course Prerequisite: Junior standing. Critical examination of current impacts and future trends in horticulture.
- 435 Chemistry and Biochemistry of Fruit and Wine** 3 Course Prerequisite: BIOLOGY 420; MBIOS 303; MBIOS 305. Study of the chemistry and biochemistry of fruits; biochemistry and physiology of individual fruit compounds, aspects of processing including winemaking. (Crosslisted course offered as HORT 435, VIT ENOL 435). Recommended preparation: Analytical chemistry.
- 445 [M] Plant Breeding** 4 Genetic principles underlying plant breeding and an introduction to the principles and practices of plant breeding. (Crosslisted course offered as CROP SCI 445, HORT 445).
- 480 Plant Genomics and Biotechnology** 3 Course Prerequisite: BIOLOGY 420. Advanced concepts in plant genomics and biotechnology with emphasis on approaches, techniques, and application. (Crosslisted course offered as HORT 480 and CROP SCI 480). Recommended preparation: MBIOS 301 or CROP SCI 444.
- 488 Anatomy and Physiology of Grapevines and Berries** 3 Course Prerequisite: BIOLOGY 420; HORT 313. Understanding of structural and functional relationships used to sustain vine health and produce high quality grapes. (Crosslisted course offered as HORT 488, VIT ENOL 488).
- 495 Research Experience** V 1-4 May be repeated for credit; cumulative maximum 12 hours. Planned and supervised undergraduate research experience. (Crosslisted course offered as CROP SCI 495, HORT 495, SOIL SCI 495).
- 499 Special Problems** V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 503 Advanced Topics in Horticulture** V 1-4 May be repeated for credit; cumulative maximum 8 hours. Current topics and research techniques in horticulture.
- 509 Seminar** 1 May be repeated for credit; cumulative maximum 12 hours. Continuous enrollment required for regularly enrolled graduate students in horticulture. Recent developments in horticulture. S, F grading.
- 510 Graduate Seminar** 1 May be repeated for credit; cumulative maximum 4 hours. Literature reviews and research progress reports.
- 513 Advanced Viticulture** 3 Wine and juice grape production in eastern Washington; wine and fruit physiology, climate and soils, and fruit quality. (Crosslisted course offered as HORT 413, VIT ENOL 413). Cooperative: Open to UI degree-seeking students.
- 516 Advanced Horticultural Crop Physiology** 3 Physiological processes related to growth, development, and productivity of horticultural crops; advances in recombinant DNA technology; the impact on horticultural practices. Credit not granted for both HORT 416 and HORT 516. Recommended preparation: BIOLOGY 420.
- 518 [M] Post-harvest Biology and Technology** 3 (2-3) Physical and physiological basis for handling and storage practices; perishable organ ontogeny and physiological disorders; post-harvest environment requirements. Field trip required. Credit not granted for both HORT 418 and HORT 518. Recommended preparation: HORT 202. Cooperative: Open to UI degree-seeking students.
- 521 Fruit Crops Management** 3 Current research and management strategies for production and quality of temperate-zone fruit crops. Credit not granted for both HORT 421 and HORT 521. Recommended preparation: HORT 310 or HORT 313.
- 535 Chemistry and Biochemistry of Fruit and Wine** 3 Study of the chemistry and biochemistry of fruits; biochemistry and physiology of individual fruit compounds, aspects of processing including winemaking. (Crosslisted course offered as HORT 435, VIT ENOL 435). Recommended preparation: Analytical chemistry.
- 550 Bioinformatics for Research** 4 (3-3) Foundational knowledge about advanced bioinformatics analyses of next-generation sequencing data. Recommended preparation: Molecular Biology and/or Genetics.
- 600 Special Projects or Independent Study** V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination** V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 800 Doctoral Research, Dissertation, and/or Examination** V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Horticulture PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

VITICULTURE & ENOLOGY

VIT ENOL

- 113 Introduction to Vines and Wines** 3 The importance of viticulture (grape growing) and enology (winemaking); wine quality. Cooperative: Open to UI degree-seeking students.
- 313 Viticulture** 3 Course Prerequisite: BIOLOGY 106, BIOLOGY 107, BIOLOGY 120, or HORT 202. Botanical relationships, plant characteristics, fruiting habits, location, culture, marketing, and utilization of grapes, berries, and other small or bush fruits. Field trip required. (Crosslisted course offered as HORT 313, VIT ENOL 313). Cooperative: Open to UI degree-seeking students.
- 326 Vineyard and Winery Equipment Systems** 3 (2-3) Course Prerequisite: HORT 313. Overview of machinery systems used in vineyards and wineries. Field trip required. (Crosslisted course offered as HORT 326, VIT ENOL 326).
- 399 Professional Work Experience** V 1 (0-3) to 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: Certified IPS major or by interview. Planned and supervised work experience. (Crosslisted course offered as HORT 399, VIT ENOL 399). S, F grading.
- 409 Seminar in Viticulture and Enology** 1 Current topics and recent developments in the field of viticulture and enology. (Crosslisted course offered as HORT 409, VIT ENOL 409).

413 Advanced Viticulture 3 Course Prerequisite: BIOLOGY 420; HORT 313; SOIL SCI 201. Wine and juice grape production in eastern Washington; wine and fruit physiology, climate and soils, and fruit quality. (Crosslisted course offered as HORT 413, VIT ENOL 413). Cooperative: Open to UI degree-seeking students.

422 Sensory Evaluation of Food and Wine 3 Course Prerequisite: STAT 212; FS 110 or VIT ENOL 113. Theory, principles and application of sensory evaluation techniques in appearance, aroma, flavor and texture of foods and wine. (Crosslisted course offered as FS 422, VIT ENOL 422). Credit not granted for both FS 422 and FS 522. Cooperative: Open to UI degree-seeking students.

433 [CAPS] [M] Critical Thinking in Vineyard and Winery Management 3 Course Prerequisite: VIT ENOL 313; VIT ENOL 413 or concurrent enrollment; VIT ENOL 326; VIT ENOL 465. Expansion and application of previous learning in viticulture and enology to develop economic and environmentally sustainable vineyard and winery management plans.

435 Chemistry and Biochemistry of Fruit and Wine 3 Course Prerequisite: BIOLOGY 420; MBIOS 303; MBIOS 305. Study of the chemistry and biochemistry of fruits; biochemistry and physiology of individual fruit compounds, aspects of processing including winemaking. (Crosslisted course offered as HORT 435, VIT ENOL 435). Recommended preparation: Analytical chemistry.

465 Wine Microbiology and Processing 3 Course Prerequisite: MBIOS 303; MBIOS 101 or 305. Technical principles related to the processing and fermentation of wines with an emphasis on microbiology. (Crosslisted course offered as FS 465, VIT ENOL 465). Credit not granted for both FS/VIT ENOL 465 and FS 565. Recommended preparation for graduate students: MBIOS 303; MBIOS 304; MBIOS 101 or 305. Cooperative: Open to UI degree-seeking students.

466 Wine Microbiology and Processing Laboratory 1 (0-3) Course Prerequisite: FS 465 or concurrent enrollment; MBIOS 101 or 304. Hands-on winemaking; application of chemical microbiological methods for wine analysis. Field trip required. (Crosslisted course offered as FS 466, VIT ENOL 466). Cooperative: Open to UI degree-seeking students.

488 Anatomy and Physiology of Grapevines and Berries 3 Course Prerequisite: BIOLOGY 420; HORT 313. Understanding of structural and functional relationships used to sustain vine health and produce high quality grapes. (Crosslisted course offered as HORT 488, VIT ENOL 488).

496 Internship in a Winery 2 May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: Sophomore standing. Industrial assignments at a regional, national or international winery. (Crosslisted course offered as FS 496, VIT ENOL 496). Cooperative: Open to UI degree-seeking students. S, F grading.

School of Hospitality Business Management

business.wsu.edu/Hospitality/
Todd Hall 342
509-335-5766

Director and W. Terry Umbreit Distinguished Professor, N. Swanger; Taco Bell Distinguished Professor, D. Gursoy; Craig Schafer Fellow, H. J. Kim; Professor, R. Harrington; Associate Professors, M. Chen, C. Chi; Assistant Clinical Professors, M. Beattie, J. Harbour, B. Marlowe, J. Sandstrom, I. Tussyadiah, F. Zach; Instructor, W. Maynard; Culver Hospitality Relations Manager, T. Thompson; Executive Chef and Catering Services Manager, J. Callison; Professors Emeriti, L. Kreck, D. Smith, W. Terry Umbreit.

The school provides specialized instruction dealing with the major organizational, managerial, financial, and technical issues relative to operation of hospitality businesses. The school prepares graduates for managerial responsibilities both here and abroad. The curriculum provides a sound business education on the fundamental features in various segments within the industry. It includes courses in general education, business, and hospitality management. The program of study leads to a degree of Bachelor of Arts in Hospitality Business Management, with a major in either hospitality business management or wine business management.

Student Learning Outcomes

The School of Hospitality Business Management will produce graduates who:

- Complete their 1000-hour industry requirement, earning employer evaluation scores of 80% or higher.
- Apply qualitative and quantitative hospitality business skills to solve problems.
- Identify service gaps and propose solutions for service recovery, while considering multiple stakeholders.
- As members of a team, through a group project, evaluate a hotel's position and present acceptable findings and/or solutions considering the implications for multiple stakeholders.
- Gain deeper understanding of different cultures and business operations from these cultures, preferably through studying abroad.

International Experience Requirement

Learning Outcomes for International Experience Requirements

On completing the International Experience Requirement, students should be able to:

- Appreciate differences in the external environmental factors that affect global business
- Identify the specific elements of the cultural environment that affect global business decisions
- Evaluate the implications of the external environmental factors on global business decisions
- Incorporate global economic, political and cultural factors when making global business recommendations

Students within the Carson College of Business must complete one of the following:

1. Study abroad for 6 or more credit hours. Two smaller study abroad programs may be cumulated to meet the entire 6 credit-hour requirement. International students in the Carson College of Business (not including WSU Global students) will meet their study abroad requirement through their study in the United States.

2. Complete a major or minor in a foreign language.

3. Students that demonstrate proficiency in a foreign language (e.g., STAMP test) will be deemed to have met the Carson College of Business International Experience Requirement. [Honors College students that meet their demonstrated proficiency in a foreign language will also be deemed to have met the Carson College of Business International Experience Requirement.]

4. Complete two of the following requirements:

- a. The Global Leadership Certificate.
- b. A certificate with a major international component (e.g. The East Asia Program) as approved by the administrative head of the Department of Marketing and International Business.
- c. A brief study abroad program of at least 3 credit hours.
- d. An international internship approved by the Department of Marketing and International Business (maximum of 3 credit hours).
- e. An "international course" as approved by the Department of Marketing and International Business. Approved courses include: AMDT 413; ANTH 301, 306, 307, 309, 312, 316, 317, 320, 330, 350, 370, 405, 417, 418, 450, 469; ARCH 428; ASIA 302, 315, 373, 374, 477, 479; BIOLOGY 401; CES 301, 325, 372, 377, 379, 380, 401, 405, 421, 426, 470; COMSOC 321; CRM J 405; CROPS SCI 360; ECONS 427, 428, 430, 433, 453; ENGLISH 373, 410, 457; ENVR SCI 410; FINE ART 331; FOR LANG 410; GEOLOGY 390; H D 350, 403; HISTORY 331, 373, 374, 436, 464, 466, 473, 477, 479, 491, 492, 494, 495; HUMANITY 350; NATRS 300, 312; PHIL 314, 315; POL S 314, 424, 427, 435; RUSSIAN 410; SOC 331, 332, 375, 415; SOIL SCI 360; TCH LRN 480, 487; WOMEN ST 316, 332, 340, 406.
- f. An approved 300-400-level "international business or economics course". Approved courses include: ACCTG 420; ECONS 327; I BUS 415, 416, 435, 453, 470, 482, 496; MIS 441.
- g. At least 3 credits in a foreign language.
- h. An accepted petition to the Department of Marketing and International Business to allow the use of extensive international travel experiences at the collegiate or corporate level for up to 3 credit hours towards the International Experience Requirement. Although petitions must be approved prior to the international travel, exceptional cases can be reviewed on a case-by-case basis. Normally such an experience will be at least three months in duration.
- i. A University course research project with an international business research focus that is a significant part of the course learning component, and that constitutes 40% or more of the class. The petition for allowing a project work to count towards the International Experience Requirement should be signed off by the course instructor, and the final approval will be made by the Department of Marketing and International Business for Pullman based students, and an IBUS Fellow or Area Director for urban campus students. *

j. Participate as finalists in an international or global case competition (e.g., Global Case Competition conducted by WSU International Programs). The determination of whether a case competition can be counted towards the International Experience Requirement will be made through a petition to the Department of Marketing and International Business. Although only final round participants can be considered, exceptional cases that did not make it to the final round can also be considered on a case-by-case basis by the Department of Marketing and International Business, which will make the final approval.

5. Complete a minimum of one year of international experience in any of the following areas: military service, Peace Corps, Volunteer work with an organization, missionary work, or other. Documentation is required for approval.

* Students also need to obtain pre-approval from course instructor prior to start of project work on the petition form that is available with advisors at the respective campus locations.

Transfer Students

A student planning to transfer to hospitality business management from a two-year program should have made appropriate academic progress before transferring. In addition, transfer students will also need to complete the 1000-hour industry experience requirement (400 hours for minors), so any such documented experience, post-high school, is very beneficial.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

HOSPITALITY BUSINESS MANAGEMENT (120 HOURS)

To be eligible for certification as a major in hospitality business management, students must have earned at least 60 semester hour of credit and completed the following certification courses with a GPA of 2.50 or higher: ACCTG 230, 231; B LAW 210; MGTOP 215; ECONS 101, 102; ENGLISH 101; MATH 201, MATH 202; MIS 250, and have a WSU cumulative GPA of 2.5. All students must apply for certification on-line. Students will also be ranked based on space availability and academic performance. Students are eligible to petition for consideration of alternative criteria.

Graduation Requirements

A minimum cumulative GPA of 2.5 in all Carson College of Business (CCB) courses required for the major is required for graduation. The calculation will only count WSU business courses that are taught by the CCB including HBM courses. Economic Sciences courses or any other courses outside the college are not included.

All students majoring in hospitality business management must complete at least 60 credit hours of their course work outside of the College of Business. MGTOP 215 may be counted as four credits towards this requirement. 1,000 hours of work experience is also required by the School of Hospitality Business Management.

In order for hours to count for the requirement, they must meet the following criteria:

- 1) Hours must be worked after high-school graduation;
- 2) All hours must be documented as paid;
- 3) Hours must be worked at a company whose primary source of revenue is derived from hospitality services; and
- 4) The employer evaluation for the hours must reflect an average of 80% across the ratings criteria on the form.

Residence Requirements: 1) At least 50% of business core and major specialization course requirements must be taken at WSU; 2) At least nine 300-400-level business, economics, or hospitality courses must be taken in residence at WSU; and 3) The last 30 hours of course work must be taken at WSU.

Transfer, correspondence, and independent study credit (within university limits on these credits) may count toward the 120 hours required for the degree and/or satisfy requirements other than major courses.

Only general elective courses that are not UCOREs, not core/major requirements, and not a course offered by the CBE may be taken pass, fail.

An honors senior project is required for Honors students.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] or SCIENCE 101 [SCI] ¹	3 or 4
ECONS 101 [SSCI] or 102 [SSCI]	3
ENGLISH 101 [WRTG]	3
Humanities [HUM]	3
MATH 201 ²	3

<i>Second Term</i>	<i>Hours</i>
ECONS 101 or 102	3
HBM 101	1
HISTORY 105 [ROOT]	3
MATH 202 [QUAN] ³	3
Physical Sciences [PSCI] or SCIENCE 102 [SCI] ¹	4 or 3
Non-Business Electives ⁴	3

Second Year

<i>First Term</i>	<i>Hours</i>
ACCTG 230	3
COM 102 [COMM] or H D 205 [COMM]	3 or 4
Diversity [DIVR]	3
HBM 280	3
Non-Business Electives ⁴	2 or 3

<i>Second Term</i>	<i>Hours</i>
ACCTG 231	3
B LAW 210	3
MGTOP 215 ⁵	4
MIS 250	3
POL S Elective	3
Complete Writing Portfolio	
Consider studying abroad this summer ⁶	

Third Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
FIN 325	3
HBM 358	3
MGMT 301	3
MKTG 360	3

<i>Second Term</i>	<i>Hours</i>
HBM 381 [M]	3
HBM 491	3
I BUS 380	3
SOC or PSYCH [SSCI] (SOC 101 or 102 preferred) ⁷	3
300-400-level Business Elective ⁸	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
ECONS 305 or 323	3
HBM 401	1
HBM 494 [M]	3
MGMT 450	3
300-400-level Business Elective ⁸	3
Non-Business Electives ⁴	2

<i>Second Term</i>	<i>Hours</i>
ENGLISH 402 or 403	3
HBM 495 [CAPS]	3
Non-Business Electives ⁴	7
Complete 1000-hour work experience	

¹ For a total of 7 credits—one Biological Science [BSCI] and one Physical Science [PSCI] course, including one lab course, or 8 credits of [SCI] designated courses. (SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI], which is offered Spring semester.)

² MATH 201 will be waived with the completion of MATH 202 or equivalent.

³ Alternative to MATH 202 is MATH 171, 140 or 206.

⁴ Non-Business courses to equal 60 credit hours.

⁵ MATH/STAT 212 will be accepted as alternative to MGTOP 215 for transfer students.

⁶ All students must complete the International Experience Requirement. Options for completing the requirement can be found in the Carson College of Business Academic Unit section of the catalog under Business. Students should consult with their advisor to determine the best option.

⁷ Required for the major.

⁸ May not include courses from the business administration core, the set of required HBM courses, or any 498 or 499 courses

WINE BUSINESS MANAGEMENT (120 HOURS)

To be eligible for certification as a major in wine business management, students must have earned at least 60 semester hour of credit and completed the following certification courses with a GPA of 2.50 or higher: ACCTG 230, 231; B LAW 210; MGTOP 215; ECONS 101, 102; ENGLISH 101; MATH 201, MATH 202; MIS 250, and have a WSU cumulative GPA of 2.5. All students must apply for certification on-line. Students will also be ranked based on space availability and academic performance. Students are eligible to petition for consideration of alternative criteria.

All students majoring in hospitality business management must complete at least 60 credit hours of their course work outside of the College of Business. MGTOP 215 may be counted as four credits towards this requirement. 1,000 hours of work experience is also required by the School of Hospitality Business Management.

Graduation Requirements

A minimum cumulative GPA of 2.5 in all Carson College of Business (CCB) courses required for the major is required for graduation. The calculation will only count WSU business courses that are taught by the CCB including HBM courses. Economic Sciences courses or any other HBM courses outside the college are not included.

In order for hours to count for the requirement, they must meet the following criteria:

1) Hours must be worked after high-school graduation;

2) All hours must be documented as paid;

3) Hours must be worked at a company whose primary source of revenue is derived from hospitality services; and

4) The employer evaluation for the hours must reflect an average of 80% across the ratings criteria on the form.

Residence Requirements: 1) At least 50% of business core and major specialization course requirements must be taken at WSU; 2) At least nine 300-400-level business, economics, or hospitality courses must be taken in residence at WSU; and 3) The last 30 hours of course work must be taken at WSU.

Transfer, correspondence, and independent study credit (within university limits on these credits) may count toward the 120 hours required for the degree and/or satisfy requirements other than major courses.

Only general elective courses that are not UCOREs, not core/major requirements, and not a course offered by the CBE may be taken pass, fail.

An honors senior project is required for Honors students.

First Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 120 [BSCI]	4
CHEM 101 [PSCI]	4
ECONS 101 [SSCI] or 102 [SSCI]	3
ENGLISH 101 [WRTG]	3
HBM 101	1

<i>Second Term</i>	<i>Hours</i>
CHEM 102	4
COM 102 [COMM] or H D 205 [COMM]	3 or 4
HISTORY 105 [ROOT]	3
MATH 201 ¹	3
SOC 101 or 102	3

Second Year

<i>First Term</i>	<i>Hours</i>
ACCTG 230	3
Creative & Professional Arts [ARTS]	3
MATH 202 [QUAN] ²	3
MIS 250	3
VIT ENOL 113	3

<i>Second Term</i>	<i>Hours</i>
ACCTG 231	3
B LAW 210	3
ECONS 101 or 102	3
MGTOP 215 ³	4
POL S Elective	3
Complete Writing Portfolio	
Domestic/International Hospitality & Wine Internship ^{4,5}	

Third Year

<i>First Term</i>	<i>Hours</i>
FIN 325	3
HBM 358	3
Humanities [HUM]	3
MGMT 301	3
MKTG 360	3

<i>Second Term</i>	<i>Hours</i>
COMSTRAT 312, COMSTRAT 380, or MKTG 4773	3
Diversity [DIVR]	3
HBM 381 [M]	3
I BUS 380	3
MGTOP 340 or MGMT 450	3
Domestic/International Hospitality & Wine Internship ^{4,5}	

Fourth Year

<i>First Term</i>	<i>Hours</i>
ECONS 305 or 323	3
FRENCH 420	3
HBM 494 [M]	3
MKTG 490 [M]	3
Non-Business Electives ⁶	3

<i>Second Term</i>	<i>Hours</i>
ENGLISH 402 or 403	3
FS/VIT ENOL 422	3
HBM 350	3
HBM 401	1
MGMT 491 [CAPS] or ENTRP 492 [CAPS]	3
Domestic/International Hospitality & Wine Internship ^{4,5}	

¹ MATH 201 will be waived with the completion of MATH 202 or equivalent.

² Alternative to MATH 202 is MATH 171, 140 or 206.

³ MATH/STAT 212 will be accepted as alternative to MGTOP 215 for transfer students.

⁴ The non-credit internships correspond to the 1,000 hours of work experience required by the School of Hospitality Business Management.

⁵ All students must complete the International Experience Requirement. Options for completing the requirement can be found in the Carson College of Business Academic Unit section of the catalog under Business. Students should consult with their advisor to determine the best option.

⁶ Non-Business courses to equal 60 credit hours.

Minors

Hospitality Business Management

To be eligible to certify in the hospitality business management minor, students must be certified in a major and have a cumulative GPA of 2.5. The minor in hospitality business management requires a minimum of 19 hours, 9 of which must be 300-400 level with an overall GPA of at least a 2.5 in the required courses. The required courses are ACCTG 230, HBM 101 or 401, and 5 College of Business or Hospitality Business Management courses of which at least nine hours must be Hospitality Business Management courses at the 300-400 level. Nine hours must be 300-400 level courses taken in residence at WSU or though WSU-approved

education abroad or educational exchange courses and they may not include any 498 or 499 courses. Up to 6 hours may be transferred from another institution. Students must ensure that they meet all course prerequisites before seeking admission to any College of Business course.

In addition, students must complete 400 hours of internship/industry experience to earn the minor. In order for hours to count for the requirement, they must meet the following criteria:

1. Hours must be worked after high-school graduation;

2. All hours must be documented as paid;

3. Hours must be worked at a company whose primary source of revenue is derived from hospitality services; and

4. The employer evaluation for the hours must reflect an average of 80% across the ratings criteria on the form.

Wine Business Management

To be eligible to certify in the wine business management minor, students must be certified in a major, have completed 60 credits, and have a cumulative GPA of 2.5. Completion of the minor requires an overall GPA of at least 2.5 in the required courses. The required courses are ACCTG 230; COMSTRAT 312, COMSTRAT 380, or MKTG 477; FRENCH 420; MKTG 360; HBM 350; ENTRP 490 or FS 422. Nine hours must be 300-400 level courses taken in residence at WSU or though WSU-approved education abroad or educational exchange courses. Up to 6 hours may be transferred from another institution.

In addition, students must complete 400 hours of internship/industry experience to earn the minor. In order for hours to count for the requirement, they must meet the following criteria:

1. Hours must be worked after high-school graduation;

2. All hours must be documented as paid;

3. Hours must be worked at a company whose primary source of revenue is derived from hospitality services; and

4. The employer evaluation for the hours must reflect an average of 80% across the ratings criteria on the form.

Description of Courses

HOSPITALITY BUSINESS MANAGEMENT

HBM

101 (182) Introduction to Industry Experience 1 Preparation for work in hospitality/business organizations; resume writing, interview skills, use of Career Services, career dress.

131 Introduction to Hospitality Business Management 3 Historical development and organizational structure of the hospitality service industries. Cooperative: Open to UI degree-seeking students.

158 Basic Restaurant Operations and Service 3 General restaurant operating concepts, dining room service procedures and food safety; sanitation principles.

- 235 [SSCI] Travel, Society, and Business 3** Social, cultural, economic, and environmental practices and principles in global travel and tourism. Cooperative: Open to UI degree-seeking students.
- 258 Fundamentals of Cooking 3** (1-6) Practical applications of cooking techniques, dining room service, and restaurant operations including safety, sanitation, flow of goods and industry trends.
- 275 Special Topics V** 1-15 May be repeated for credit. S, F grading.
- 280 Hospitality Systems 3** Management functions relating to the planning and operational policies of various hotel departments.
- 298 Internship Experience V** 1 (0-3) to 12 (0-36) May be repeated for credit; cumulative maximum 12 hours. Cooperative educational internship with a hospitality business, government, or non-profit organization. S, F grading.
- 301 Introduction to Event Planning 3** Course Prerequisite: ACCTG 230; certified major in the College of Business, or certified minor in Hospitality Business Management. Overview of event planning industry, including components, interrelationships, economics, and theory.
- 350 Beverage Management 3** Beverage operations; detailed study of wines and spirits; consideration of social impacts such as trends in consumption.
- 358 Foodservice Systems and Control 3** Course Prerequisite: ACCTG 230; certified major in the College of Business, or certified minor in Hospitality Business Management. Operational control processes, control systems, and cost analysis procedures in food and beverage management.
- 375 Introduction to Senior Living Management 3** Course Prerequisite: ACCTG 230. Introduction to the unique aspects of managing senior housing communities. Field trip required.
- 381 [M] Hospitality Leadership and Organizational Behavior 3** Course Prerequisite: ACCTG 230; certified major in the College of Business, or certified minor in Hospitality Business Management. Focusing on interpersonal skills and group dynamics; covers key hospitality leadership and management issues. Cooperative: Open to UI degree-seeking students.
- 383 Meeting and Convention Management 3** Course Prerequisite: HBM 301; certified major in the College of Business, or certified minor in Hospitality Business Management. Theory and practice of meeting/convention/event management, including goals, organization on- and off-site operations, evaluation.
- 384 Managed Services 3** Course Prerequisite: ACCTG 230; certified major in the College of Business, or certified minor in Hospitality Business Management. Management systems of the segment of the hospitality industry relating to contract and self-operated management companies. Field trip required.
- 401 (320) Industry Experience 1** Course Prerequisite: ACCTG 230; certified major in the College of Business, or certified minor in Hospitality Business Management. Final employment preparation to include mock traditional/panel interviews, resume/cover letter critiques, etiquette dinner, and networking.
- 458 Advanced Culinary Management and Catering 3** Course Prerequisite: HBM 258; certified major in the College of Business, or certified minor in Hospitality Business Management. Advanced kitchen/dining room management with emphasis on culinary skill development and the planning and administration of catering events.
- 480 [M] Marketing Strategy and Development 3** Course Prerequisite: MKTG 360; certified major in the College of Business, or certified minor in Hospitality Business Management. Theory and practice; problems in guest relations, special sales efforts, intramural promotion, research.
- 491 Operational Analysis 3** Course Prerequisite: ACCTG 231; MGTOP 215; FIN 325; HBM 280; certified major in the College of Business, or certified minor in Hospitality Business Management. Using management tools in analyzing operational effectiveness of hotel and restaurant organizations.
- 494 [M] Service Operations Management 3** Course Prerequisite: ACCTG 230; certified major in the College of Business, or certified minor in Hospitality Business Management. Design and management of service delivery systems through operations management topics from a service perspective.
- 495 [CAPS] Case Studies and Research 3** Course Prerequisite: HBM 358; HBM 491; HBM 494; certified major in the College of Business, or certified minor in Hospitality Business Management; junior standing. Use of the case method and computerized statistical programs in the analysis of administrative practices of organizations.
- 497 Special Topics V** 1-3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: ACCTG 230; certified major in the College of Business, or certified minor in Hospitality Business Management. Topics of special interest within the area of hotel and restaurant administration.
- 498 Hospitality Business Management Internship V** 1-15 May be repeated for credit; cumulative maximum 15 hours. Cooperative educational internship with a business, government or nonprofit organization. S, F grading.
- 499 Special Problems V** 1-4 May be repeated for credit. Course Prerequisite: By department permission. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 535 International Tourism Strategy and Planning 3** Course Prerequisite: Admission to the MBA program. Tourism components; social, economic, and cultural effects on societies; the management of tourism businesses.
- 581 Services Management 3** Course Prerequisite: Admission to the MBA program. Design and management of service systems in hospitality operations; control of customer interaction, personnel activities and inventory.
- 582 Hospitality Operations Analysis 3** Yield/revenue management and managerial accounting concepts within the hospitality industry.
- 591 Service Management Seminar 3** Course Prerequisite: Admission to PhD programs in business. Survey of selected concepts, frameworks, theory, issues and empirical research in service management.
- 592 Current Issues in Travel and Tourism 3** Course Prerequisite: Admission to PhD programs in business. Current issues, practices, principles and theory, research and methodologies that govern travel and tourism behavior.
- 597 Special Topics 3** Course Prerequisite: Admission to PhD programs in business. Strategic business policy, concepts, and practices in hospitality management.
- 600 Special Projects or Independent Study V** 1-18 May be repeated for credit. Course Prerequisite: Admission to the MBA, Master of Accounting, or Business PhD programs. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 800 Doctoral Research, Dissertation, and/or Examination V** 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Business Administration - Hospitality and Tourism PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Department of Human Development

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Professor and Chair, L. Hill; Professors, L. Parker, T. Power; Associate Professors, C. Blodgett, B. Boyd, M. Bumpus, M. K. Deen, M. Diversi, D. Handy, J. Lanigan, P. Pendry, K. Rodgers, Y. Sano, S. Smith, E. Soliday; Assistant Professors, C. Bolkan, M. Cleveland, B. Cooper, R. Cooper, S. Perone, K. Rhoades, S. Waters, E. Weybright; Instructors, J. Hewa, L. Krupke, A. Lawrence, D. Nelson, J. Pittman, M. Wandschneider;

Adjunct Instructors, T. Ashford, D. Bice, W. Ewest, V. Fischer, M. Garcia, S. Grant, N. Porter, S. Rusca, C. Seeley, A. Shepherd, T. White; Professors Emeriti, J. Dillman, S. Horton, J. McReynolds, K. Peterson, G. Tan, M. Tate, M. Young.

Undergraduate Program

Students seeking a bachelor of arts degree in this department focus on human development across the lifespan as it occurs within the family, linked to a variety of contexts within communities. The program centers on understanding the complexity of physical, social, cognitive, and emotional development with an emphasis on development within the family. The curriculum examines human and family development across the lifespan (i.e., child, adolescent, younger and older adults). Opportunities are also available to become state certified as a family and consumer sciences teacher in junior high or senior high school.

In addition to the teaching certification, the department offers four certificates: early childhood education, adolescence, gerontology, and family studies. Students choosing these certificates are prepared to work in a wide range of careers working with children, adolescents, older adults, and/or families in a variety of professional settings. These may include positions in foster parent programs, adoption agencies, childcare or Head Start programs, teen centers, juvenile justice programs, nursing homes or other community-based programs for the elderly, and family services agencies.

Students completing a human development degree may complete a certified minor or approved certificate of study in another department. A minor or certificate of study should be selected in consultation with a human development advisor, preferably by the end of the third semester.

Student Learning Outcomes

We expect our graduating students will demonstrate: 1) an understanding of social, emotional, cognitive, and physical development across the lifespan in the family context; 2) an understanding of how contextual systems interact to influence family and individual development; 3) the ability to critically select, evaluate, and utilize information to understand and benefit individuals and families; 4) writing, listening, and speaking appropriate for human development related occupations; 5) application of human development knowledge and skills in professional settings.

Graduate School Preparation

The human development degree provides preparation for graduate work leading to teaching, research, counseling, or administrative positions in academia, social services, or family therapy.

Graduate Program

The department also administers an interdisciplinary doctoral program in Prevention Science. Students in the program learn to develop, evaluate, and disseminate scientifically-based programs to promote the well-being of children, youth, and their families. The program is offered in collaboration with the Colleges of Communication, Education, and Nursing, as well as WSU Extension. Graduates are prepared for careers as faculty members, program evaluators, research analysts, and research associates to work in a range of settings

including universities, research institutes, social service agencies, and consulting firms.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

HUMAN DEVELOPMENT - FAMILY AND CONSUMER SCIENCES OPTION (120 HOURS)

The Bachelor of Arts degree in Human Development requires a cumulative GPA of 2.6 or better in all H D courses, including substitutions. Of the 49 H D hours required for the major, a minimum of 21 must be taken in residence at WSU.

First Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 140 [BSCI]	3
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3
H D 101 [SSCI]	3
Quantitative Reasoning [QUAN]	3 or 4

<i>Second Term</i>	<i>Hours</i>
ENGLISH 201 [WRTG] ¹	3
H D 200	2
HISTORY 105 [ROOT]	3
Humanities [HUM]	3
Physical Sciences [PSCI] with lab	4

Second Year

<i>First Term</i>	<i>Hours</i>
AMDT Elective ²	3
H D 204	3
H D 220	3
H D 306	3

<i>Second Term</i>	<i>Hours</i>
H D 302	3
H D 307	3
H D 310 [M]	3
HBM 258	3
TCH LRN 301	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
AMDT Elective ²	3
H D 320 [M]	3
H D 350 [DIVR]	3
H D 479	3
TCH LRN 317	2

<i>Second Term</i>	<i>Hours</i>
H D 410 [M]	3
H D 480	3
Integrative Capstone [CAPS]	3
TCH LRN 464	3
TCH LRN 465	3
TCH LRN 466	2

Fourth Year

<i>First Term</i>	<i>Hours</i>
AG ED 440	2
ED PSYCH 468	3
H D 499	3

TCH LRN 467	3
TCH LRN 469	2
TCH LRN 470	3

<i>Second Term</i>	<i>Hours</i>
H D 407	8
TCH LRN 415	8

¹ One from ENGLISH 201, 301, 302 [M] or 402 is required for admission to the Teacher Education Program. Students who take ENGLISH 302 will need to take an additional [WRTG] or [COMM] course.

² Select two from: AMDT 210, 211, or 417.

HUMAN DEVELOPMENT - GENERAL OPTION (120 HOURS)

The Bachelor of Arts degree in Human Development requires a cumulative GPA of 2.6 or better in all H D courses, including substitutions. Of the 42-44 H D hours required for the major, a minimum of 21 must be taken in residence at WSU.

First Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
H D 101 [SSCI]	3
Natural Sciences [BSCI], [PSCI], or [SCI] ¹	3
Quantitative Reasoning [QUAN]	3
Written Communication [WRTG]	3

<i>Second Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
H D 200	2
HISTORY 105 [ROOT]	3
Natural Sciences [BSCI], [PSCI], or [SCI]; (with lab) ¹	4
Minor, Certificate, and/or General Electives ²	3

Second Year

<i>First Term</i>	<i>Hours</i>
H D 204	3
H D 220	3
Humanities [HUM]	3
Minor, Certificate, and/or General Electives ²	6

<i>Second Term</i>	<i>Hours</i>
H D 306, 307, or 308	3
H D 320, 334, 341, 342, 430, 480, or 482	3-4
H D 350 [DIVR]	3
Minor, Certificate, and/or General Electives ²	6
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
H D 300, 301, 302, or 360	3
H D 306, 307, or 308	3
H D 310 [M]	3
Minor, Certificate, or General Electives ²	6

<i>Second Term</i>	<i>Hours</i>
H D 403, 405, 406, or 479	3
Minor, Certificate, or General Electives ²	12

Fourth Year

<i>First Term</i>	<i>Hours</i>
H D 385 or 497 ³⁴	3
H D 496 or Elective ³	1

Integrative Capstone [CAPS]	3
Minor, Certificate, or General Electives ²	8
<i>Second Term</i>	
H D 410 [M]	3
H D 446 or 498 ⁵⁶	3-6
Minor, Certificate, or General Electives	9

¹ For a total of 7 credits—one Biological Science [BSCI] and one Physical Science [PSCI] course, including one lab course, or 8 credits of [SCI] designated courses. (SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI], which is offered Spring semester.)

² Students strongly encouraged to pursue a minor or certificate. Elective credits should include sufficient 300-400-level courses to meet University requirement of 40 upper-division credits.

³ H D 385 and 496 are required for Vancouver students only and must be completed before H D 498 or 446.

⁴ H D 497 is required for Pullman students only and must be completed prior to H D 446 or 498.

⁵ All H D majors complete a practicum/internship experience. H D 446 is reserved for students completing the certificate in Early Childhood Education and requires a half-day each day, 5 days a week for a semester and can be put into the schedule any time after taking H D 342. All other H D majors complete H D 498.

⁶ The internship course (H D 498) can be taken during the summer semester of the junior or senior year. H D 497 must be taken before H D 498 but no more than two semesters before taking the internship. H D 385 and H D 496 must be taken before completion of H D 498 for Vancouver students. Vancouver students are required to take 3 credits of H D 498. Pullman and Global students must complete 4 credits of H D 498.

Minors

General Human Development

The General Human Development minor requires 18 hours and a cumulative GPA of 2.6 or better in coursework used to fulfill this minor. Required coursework includes H D 101, 204, 220, and 9 additional H D elective hours selected from H D 300, 301, 302, 306, 307, 308, 320, 340, 341, 350, 360, 385, 403, 405, 406, 408, 430, 479, 480, 482, and a maximum of 3 credits of 485. Coursework must include a minimum of 9 hours of 300-400-level courses taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Certificates

Adolescence

The department of Human Development offers a Certificate in Adolescence. The certificate reflects a high standard of training and experience in this specific area of human development. Non-human development majors are required to complete any prerequisites for the internship requirement. The requirements include 6 hours in H D core courses that support the area of certification, 15 hours in required and optional courses and 4 hours of

internship that reflect the area of certification. Students must maintain an overall GPA of 2.5 in those courses that count toward the certificate.

Required courses: H D 202, 302, 408, 420, 498, one other 300-400 level H D course, H D 479 or 480, and one from PSYCH 230, 265, SOC 360, or 362.

Early Childhood Education

The department of Human Development offers a Certificate in Early Childhood Education. The certificate reflects a high standard of training and experience in the specific area of human development. Non-human development majors are required to complete any prerequisites for the internship requirement.

The requirements include 6 hours in H D core courses that support the area of certification, 15 hours in required and optional courses, and 4 hours of internship that reflect the area of certification. Students must maintain an overall GPA of 2.5 in those courses that count toward the certificate. Required courses: H D 201, 235, 302, 341, 342, 420, 446, 482.

Family Studies

The department of Human Development offers a Certificate in Family Studies. The certificate reflects a high standard of training and experience in the specific area of human development. Non-human development majors are required to complete any prerequisites for the internship requirement. The requirements include 6 hours in H D core courses that support the area of certification, 15 hours in required and optional courses, and 4 hours of internship that reflect the area of certification. Students must maintain an overall GPA of 2.5 in those courses that count toward the certificate.

Required courses: H D 204, 301, 302, 320, 350, 403, one other 300-400 level H D course, H D 498.

Gerontology

The department of Human Development offers a Certificate in Gerontology. The certificate reflects a high standard of training and experience in the specific area of human development. Non-human development majors are required to complete any prerequisites for the internship requirement.

The requirements include 6 hours in H D core courses that support the area of certification, 15 hours in required and optional courses, and 4 hours of internship that reflect the area of certification. Students must maintain an overall GPA of 2.5 in those courses that count toward the certificate. Required courses: BIOLOGY 140; H D 203 or 305; PSYCH 363 or 490; SOC 351 or 356. Elective Courses, 6 hrs minimum from the following: BIOLOGY 233; HBM 375, 497; H D 203, 305 (if not used in required), 360; KINES 264, 361; MGMT 101, 301; PHIL 103, 365; PSYCH 320, 363, 490 (if not used in required); SOC 250, 351, 356 (if not used in required); H D 497, H D 498.

Human Services Case Management and Administration

The Certificate in Human Services Case Management and Administration, administered by the Department of Human Development, is designed to assist students in building a theoretical

and applied understanding of working with people in a variety of human service settings including, but not limited to, social service agencies, health care agencies, non-profits, and educational institutions. Students are able to concentrate on either case management, which is focused on those wanting to work with clients, or administration, which is developed for those interested in managerial and supervisory roles.

To be admitted into the Certificate Program, students must be (1) certified in their WSU major or be a non-degree-seeking student, (2) have at least a cumulative GPA of 2.0, and (3) completed 60 semester credits. The certificate is awarded based upon successful completion of 6 courses (at least 3 credits each for a total of 18 semester credit hours). A final grade of "C" or better is required for each course to be applied to the certificate. Credit hours for the certificate must include at least nine hours of upper-division work taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. Students must obtain approval of their course selections from the program chair in Human Development.

Description of Courses

HUMAN DEVELOPMENT

H D

101 [SSCI] Human Development Across the Lifespan 3 Overview of lifespan development from a psychosocial ecological perspective; individuals, families, organizations, and communities and their interrelationships.

200 Introduction to the Field of Human Development 2 Introduction to the multidisciplinary field of human development and the research and outreach of faculty in this field.

204 [SSCI] Family Interactions 3 Introduction to the study of family processes: family generational, emotional, boundary, rule, and ritualistic systems.

205 [COMM] Developing Effective Communication and Life Skills 4 (3-2) Enhancing interpersonal communication, leadership, and team skills through action-based learning.

220 (420) Human Development Theories 3 Introduction to foundational human development theories, key concepts, comparison, and application of theory to inform practice.

235 Introduction to Early Childhood Programs 1 Course Prerequisite: H D 201 or 340. Introduction to the field of early childhood education; connection with a field placement site in a community based child care program for H D 342 is required. For students completing Early Childhood certificate. S, F grading.

275 Special Topics in Human Development: Study Abroad V 1-6 May be repeated for credit; cumulative maximum 6 hours. S, F grading.

- 300 Child Maltreatment** 3 Course Prerequisite: H D 101; H D 204; sophomore standing. Overview of causes, identification, reporting, and treatment of children who are abused and/or neglected.
- 301 Family Stress and Coping** 3 Course Prerequisite: H D 101; H D 204; sophomore standing. Examination of the nature and course of family crisis, using a family systemic approach, including principles used in intervention strategies.
- 302 Parent-Child Relationships** 3 Course Prerequisite: Junior standing. Parenting in contemporary society with focus on reciprocity of parent-child relationships and diversity of families.
- 306 (340) Child Development** 3 Course Prerequisite: H D 101; H D 220; sophomore standing. Understanding growth and change across all developmental domains from prenatal through age 6, including contextual influences on the early years.
- 307 (202) Middle Childhood and Adolescent Development** 3 Course Prerequisite: H D 101; H D 220; sophomore standing. Understanding growth and change across all developmental domains from middle childhood through adolescence, including contextual influences on these years of development.
- 308 (203) Adult Development** 3 Course Prerequisite: H D 101; H D 220; sophomore standing. Understanding growth and change in early through late adulthood, including contextual influences on the adult years of human development.
- 310 [M] Research Methods** 3 Course Prerequisite: H D 200; certified major in Human Development; sophomore standing. Overview of research techniques in human development; methods of evaluating research products.
- 320 [M] Resource Management** 3 Course Prerequisite: Sophomore standing. Styles of managing material, human and environmental resources with families; analysis of consumer role; interaction of consumers, government, market; various approaches to problem solving with individuals and families; effects on communities, families, and individuals.
- 334 [SSCI] Principles of Community Development** 3 Course Prerequisite: Sophomore standing. Factors influencing how communities grow and decline and the ways in which social interventions influence these outcomes.
- 341 Guidance in Early Childhood Programs** 3 Course Prerequisite: H D 306; sophomore standing. Theories of child guidance; understanding of child behavior; strategies and techniques for effective group and individual guidance of young children.
- 342 Curriculum for Early Childhood Programs** 4 (3-3) Course Prerequisite: H D 235; H D 341; sophomore standing; by permission only. Planning and implementation of developmentally appropriate curriculum for use in programs serving young children.
- 350 [DIVR] Family Diversity** 3 Course Prerequisite: Sophomore standing. Preparation for students in human service professions to work with ethnic, cultural, economic, language, gender, religious and other types of diversity.
- 360 Death and Dying** 3 Course Prerequisite: H D 101; sophomore standing. Death and dying throughout life and in different contexts; manner of death, grief, and legal and ethical considerations.
- 385 Perspectives in Human Services** 3 Course Prerequisite: Sophomore standing. In-depth study of human service practice, theoretical perspectives and strategies for delivery of appropriate services to diverse clientele.
- 403 [CAPS] Families in Poverty** 3 Course Prerequisite: Junior standing. Examining poverty in US and globally; description of groups most often poor; identification of effective solutions and successful interventions.
- 405 (305) Gerontology** 3 Course Prerequisite: Junior standing. Examination and analysis of social context of aging including public policy, implications of demographic shifts, and quality-of-life issues.
- 406 Work and Family** 3 Course Prerequisite: Junior standing. Issues related to work and family; workplace environments; fostering effective policy responses to family needs; role of work-family coordination.
- 407 Student Teaching for Family and Consumer Sciences** V 4-16 Course Prerequisite: TCH LRN 415; junior standing; by permission only. Supervised teaching in public schools, including seminars reflecting on effective teaching. S, F grading.
- 408 Advanced Adolescent Development** 3 Course Prerequisite: Junior standing. In-depth examination of theories and research; developmental issues and prevention and intervention programs for school-aged child and adolescent.
- 410 [M] Public Policy Issues in Human Development** 3 Course Prerequisite: H D 310; junior standing. Family policy issues in a changing society; ecological perspective; relationship of public policy to communities, organizations, families, and individuals. Recommended: H D 310.
- 415 [CAPS] Peak Experiences in Leadership** 3 Course Prerequisite: Junior standing. Experiential human development course that utilizes challenge and application to develop personal and group leadership skills.
- 430 Professional and Grant Writing Skills** 3 Course Prerequisite: H D 385; junior standing. Examination and development of skills important for effective professionals; communication, leadership, ethical behavior, cultural competence, grant writing, evaluation, and others.
- 446 Practicum in Early Childhood Programs** 6 May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: H D 342; junior standing; by permission only. Supervised teaching; emphasis on skill building in working with diverse groups of children and building partnerships with families.
- 449 Early Childhood Seminar** 3 Course Prerequisite: H D 306; junior standing. Identification and examination of current issues and trends in early childhood education with emphasis on child, family, and community concerns.
- 464 Administration of Early Childhood Programs** 3 Course Prerequisite: H D 306; junior standing. Organization, administration, and management of early childhood programs; finance, program development, service delivery, personnel concerns, resource development, and evaluation.
- 479 Planning and Evaluation in Human Development** 3 Course Prerequisite: Junior standing. Design, implementation and evaluation of community/school programs; needs assessment; appropriate curriculum resource identification; outcomes development; includes individual and program evaluation.
- 480 Instructional Strategies in Human Development** 3 Course Prerequisite: Junior standing. Identification and use of instructional strategies; evaluation of strategies to determine appropriate use and effectiveness with a variety of learners.
- 482 Child Assessment and Evaluation** 3 Course Prerequisite: H D 306; junior standing. Understanding aspects of assessment and evaluation of young children; selection, administration, summary development, ethics and professional responsibilities, evaluation and follow-up.
- 485 Participation in Human Development Research** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: By permission only. Supervised participation in faculty research including data collection, analysis, literature review, preparation of findings. S, F grading.
- 486 Special Topics in Human Development: Study Abroad** V 1-15 May be repeated for credit; cumulative maximum 15 hours. Course Prerequisite: Sophomore standing. S, F grading.
- 487 Special Topics in Human Development** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Junior standing. Assessment and evaluation of families and children.
- 495 Instructional Practicum** V 1-4 May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: By permission only. Opportunity to assist with instruction; experience in further study of topic, organization of material, grading, management of resources. S, F grading.
- 496 Field Placement Preparation** 1 Course Prerequisite: H D majors or H D certificate students; junior standing; by permission only. Investigation of career goals, interviewing and professional presentation, resume preparation, internship competencies, and field placement procurement. S, F grading.

- 497 Professional Preparation Seminar 3**
Course Prerequisite: Junior standing; by permission only. Human service career preparation through examining related careers, career self-assessment, professional presentation, professional ethics, professional competencies, and field placement procurement.
- 498 Field Placement V 1 (0-3) to 8 (0-24)** May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: H D 385 and 496, or H D 497; by permission only. Self-initiated, supervised work experience with appropriate private organizations, businesses, or government agencies; interaction with professionals in related fields.
- 499 Special Problems V 1-4** May be repeated for credit. Course Prerequisite: By permission only. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 505 Developing Effective Leadership: Tidal Leadership 2** Customized leadership course for acquiring essential skills beyond the discipline skills for professional and personal success; build a personal leadership platform. S, F grading.
- 511 Theory and Substance of Human Development I 3** Human development theories; application to life span development, cultural variations, resources, problem solving, interaction of families and individuals with other systems.
- 514 Research Methods in Human Development II 3** Course Prerequisite: H D 513. Integration of formal decision making into the social science research process; procedures appropriate for experimental, quasi-experimental and field research. Cooperative: Open to UI degree-seeking students.
- 520 Adolescence 3** In-depth examination of theories and research, developmental issues and prevention and intervention programs for school-aged children and adolescents.
- 550 Seminar on Family Relationships 3** Survey of family studies topics and issues examined from a research point of view.
- 558 Parent-Child Relationships 3** The reciprocal interactions among family members will be examined; theoretical perspectives and empirical findings will be explored in terms of implications for education and practice.
- 560 Seminar in Child Development 3** Survey of literature on selected areas in child development; discussion of research and application related to current issues and trends.
- 561 Advanced Curriculum for Early Childhood Programs 3** Opportunity to explore curriculum practices in early childhood education; discussion, evaluation and adaptation of curricula based on current research.
- 562 Administration and Leadership in Programs 3** Examining early childhood administrator role; analysis and application of research to administration, developing concrete skills necessary for successful administration.
- 580 Families, Community and Public Policy 3** Course Prerequisite: H D 560. Analysis of family policy research; role of family policy research in public policy and knowledge building processes. Cooperative: Open to UI degree-seeking students.
- 586 Special Topics in Human Development V 1-3** May be repeated for credit; cumulative maximum 6 hours. Assessment and evaluation of families and children.
- 598 Professional Internship 3** Supervised individual experiences with related organizations, businesses, or government agencies; opportunities for interaction with professionals in related fields. S, F grading.
- 600 Special Projects or Independent Study V 1-18** May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination V 1-18** May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

PREVENTION SCIENCE

PREV SCI

- 511 Introduction to Prevention Science 3** Disciplinary roots; the epidemiological approach to risk and prevention; design, implementation, and dissemination of preventive interventions.
- 513 Research Methods in Prevention Science 3** Introduction to process of research and methods in prevention science; techniques of research, data collection, and data analysis procedures.
- 535 Effective Prevention Strategies I 3** Community mobilization and problem analysis; program selection, implementation, and management; grant writing.
- 540 Effective Prevention Strategies II 3** Course Prerequisite: PREV SCI 535. Evaluation of prevention science programs.
- 700 Master's Research, Thesis, and/or Examination V 1-18** May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

- 800 Doctoral Research, Dissertation, and/or Examination V 1-18** May be repeated for credit. Course Prerequisite: Admitted to the Prevention Sciences PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

The Humanities

libarts.wsu.edu/english/
Avery 202
509-335-2581

Academic Coordinator, L. McCormick.

The humanities curriculum consists of a series of interdisciplinary courses designed to introduce students to some of the basic concepts of civilization through the study of representative masterpieces of literature, music, art, and related fields. The courses numbered 101, 302, 303, and 304 provide a survey of western civilization from ancient times to the modern era. English majors may substitute (by exception) upper-division Humanities courses for any literature elective requirement in their option.

Using Humanities courses as part of General Studies-Humanities Major

WSU-Pullman students who are interested in the interdisciplinary study of culture can use a number of the courses listed below as a minor concentration in a degree program in General Studies-Humanities. A recommended sequence would include at least three from Hum 101, 302, 303, 304, which provide students a survey of arts and thought from ancient times to the present. Any of the other humanities courses, including the study-abroad option, could be used as well.

Minors

Humanities

The humanities minor is particularly appropriate for communication students with international interests, foreign languages majors seeking to broaden their studies beyond their major language, and history and business majors with interests in international arts and literature. The student must complete a minimum of 18 hours in courses listed under "Humanities" of which at least half must be 300-400-level taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Description of Courses

HUMANITIES

HUMANITY

- 101 [HUM] Humanities in the Ancient World** 3 Integrated humanities: literature, philosophy, history, and art of the ancient world. (Crosslisted course offered as HUMANITY 101, FOR LANG 102).
- 103 [HUM] Mythology** 3 The theory of mythology and use of myths in art, literature, and music; Greco-Roman and one other.
- 120 Traditional Chinese Culture** 3 Cultural development of China from early times through the golden age of Chinese civilization. Taught in English. (Crosslisted course offered as CHINESE 120, ASIA 120, HUMANITY 120).
- 130 [HUM] Global Literature in Translation** 3 Taught in English. An introduction to the study of international literature; stories, cultures, and literary devices. (Crosslisted course offered as FOR LANG 130, HUMANITY 130).
- 131 [DIVR] Masterpieces of Asian Literature** 3 Introduction to Asian literature. Taught in English. (Crosslisted course offered as CHINESE 131, ASIA 131, HUMANITY 131, JAPANESE 131). Cooperative: Open to UI degree-seeking students.
- 301 Diversity Lecture Series** 1 Guest lecturers in the humanities explore themes in cultural diversity.
- 302 [HUM] [M] Humanities in the Middle Ages and Renaissance** 3 Integrated humanities; exploring great works and themes of the European Middle Ages and Renaissance, including art, architecture, music, philosophy, and literature. (Crosslisted course offered as HUMANITY 302, FOR LANG 302).
- 303 [M] Reason, Romanticism, and Revolution** 3 Integrated humanities; literature, philosophy, music, art, 1700 to World War I; revolutionary changes which led to the 20th century. (Crosslisted course offered as HUMANITY 303, FOR LANG 303).
- 304 [HUM] Humanities in the Modern World** 3 Literature, philosophy, art, architecture, film, music since World War I; major works reflecting influential movements and concerns of the modern world. (Crosslisted course offered as HUMANITY 304, FOR LANG 304).
- 320 [DIVR] [M] Issues in East Asian Ethics** 3 Philosophical foundations of ethical thought in East Asia; informed responses to modern ethical dilemmas. Taught in English. (Crosslisted course offered as JAPANESE 320, ASIA 320, CHINESE 320, HUMANITY 320). Cooperative: Open to UI degree-seeking students.
- 322 [DIVR] Ecology in East Asian Cultures** 3 Major ecological issues in East Asia through cultural representations, and analysis of their implications to the U.S. (Crosslisted course offered as ASIA 322, CHINESE 322, HUMANITY 322, JAPANESE 322).

335 The Bible as Literature 3 Historical and literary approach to texts of the Jewish and Christian scriptures; emphasis on history, interpretation, and influence.

338 Topics in Humanities 3 May be repeated for credit; cumulative maximum 6 hours. Interdisciplinary, international topics in the humanities (art, architecture, music, literature, philosophy, film).

350 Sacred Texts and Cultures of World Religions 3 Sacred and literary texts, spiritual practices, and cultural origins and values of six world religious traditions from an intercultural perspective.

410 Love in the Arts 3 Course Prerequisite: Junior standing. Concepts of love around the world and in history through literature, art, music, dance, and theater.

450 Representations of the Holocaust 3 Course Prerequisite: Junior standing. How the Holocaust is represented and enters public memory through documentaries, memoirs, works of fiction, poetry, film, museums and monuments.

499 Special Problems V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.

Program in Integrated Plant Sciences

ips.wsu.edu
Hulbert Hall 423
509-335-8406

Integrated Plant Sciences Program Director, D. Layne; Crop and Soil Sciences Department Chair and Professor, R. Koenig; Viticulture and Enology Director and Professor, T. Henick-Kling; School of Economic Sciences Director and Professor, A. Love; Plant Pathology Director and Professor, S. Hulbert; Horticulture Department Chair and Professor, B.W. Poovaiah; Entomology Department Chair and Professor, S. Sheppard; School of Food Science Director and Professor, B. Rasco; Teaching Faculty, B. Bondada, M. Brady, I. Burke, C. Campbell, K. Campbell, L. Carpenter-Boggs, A. Carter, D. Cobos, T. Collins, J. Cowan, D. Crowder, J. Davenport, A. Dhingra, J. Durfey, C. Edwards, J. Fellman, A. Felsot, M. Flury, J. Harsh, J. Holden, P. Jacoby, B. Jaeckel, M. Kumar, V. Lohr, K. Murphy, B. Naravane, M. Neff, W. Pan, H. Pappu, C. Peace, T. Peever, C. Perillo, M. Pumphrey, M. Quinn, N. Rayapati, J. Reganold, C. Ross, R. Rupp, K. Sanguinet.

The science of plant life from molecule to market is the focus of the Integrated Plant Sciences (IPS) degree program. The degree is delivered collaboratively by departments within the College of Agricultural, Human, and Natural Resource Sciences. The IPS degree provides students with an exciting depth and breadth of knowledge that encompasses a variety of plant science disciplines, including crop and soil

sciences, horticulture, entomology, plant pathology, and food science. Students pursuing a Bachelor of Science degree in Integrated Plant Sciences may choose among six majors highly sought by employers in the state and nationally: Agricultural Biotechnology; Field Crop Management; Fruit and Vegetable Management; Landscape, Nursery, and Greenhouse Management; Turfgrass Management; or Viticulture and Enology (Pullman and Tri-Cities campus).

Bachelor of Science in Integrated Plant Sciences

IPS majors explore the science of plant development and production from the perspectives of a variety of disciplines. All students in the program take a core set of interdisciplinary courses selected specifically to give them a solid foundation on which they can build expertise in a specific area.

In order to certify in an IPS major, a student must have a minimum of 24 credits with a minimum cumulative GPA of 2.0. For complete information about all majors within the IPS degree programs, please see the IPS webpage at: <http://ips.wsu.edu>.

In addition to WSU's Six Learning Goals of the Baccalaureate, successful IPS graduates also will be able to:

- Apply scientific and quantitative reasoning to address real world problems in plant production and management systems.
- Understand the growth and development of horticultural and agronomic crop plants, current management practices, and factors that influence yield, aesthetics, and end-use quality.
- Integrate skills, facts, concepts, principles and research methods from plant and other sciences in order to actively participate in a wide variety of environmental and agricultural activities, including research, outreach, education, and management.
- Understand and appreciate the importance of horticultural and agronomic crop plants to global society, and use this knowledge to contribute to the welfare of global society.
- Obtain, evaluate, and apply scholarly information to expand understanding and knowledge-base of the plant sciences.
- Communicate effectively to a broad range of audiences using appropriate traditional and emerging technological media.
- Appreciate the breadth and depth of professional opportunities in plant sciences.

The hands-on possibilities within the IPS degree are numerous. Students are required to participate in Experiential Education which includes undergraduate research projects, work as part-time employees with research and extension personnel, study abroad, and/or participate in professional internships to put their classroom training to work. Learn, lead, and connect through the Center for Transformational Learning and Leadership (<http://ctl.cahnrs.wsu.edu>). Student clubs also provide a variety of ways to interact with peers, faculty, and staff within the college, yet another way to enrich the educational experience. See <http://cahnrs.wsu.edu/academics/Student-life/clubs/>.

Scholarships

Scholarships for IPS majors are available on a competitive basis and are awarded based on ability, need, and interest in a career path in plant sciences. (<http://cahnrs.wsu.edu/academics/scholarships/>).

Transfer Students

Students planning to transfer into the IPS program should take courses that meet the University Common Requirements (UCORE) and the IPS core requirements when possible. Transfer articulation agreements have been developed with several Washington community colleges degree programs. More information can be found on our Transfer Student website: <http://cahnrs.wsu.edu/academics/transfer/>. Prospective transfer students are strongly encouraged to consult with an advisor within the IPS program for further guidance.

Graduate Studies

Master of Science in Agriculture (Pullman and Global Campus)

This advanced degree program focuses on the agricultural professional, practitioner, and educator to meet the growing need for prepared individuals to apply new and emerging technologies and science to the advancement of agriculture. This degree offers professionals already working in the field the opportunity to continue their education while they continue employment either inside or outside of the Pullman area. Students may elect to customize their program or choose from three options: General Agriculture, Food Science and Management, or Plant Health Management (online only). Access complete program description on-line at: <http://msag.wsu.edu/>.

Master of Science and Doctor of Philosophy degrees are also offered in Crop Science, Economics, Entomology, Food Science, Horticulture, Plant Pathology, and Soil Science. More information can be found on the CAHNRS Graduate Studies website: <http://cahnrs.wsu.edu/academics/graduate-studies/>.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

AGRICULTURAL BIOTECHNOLOGY (120 HOURS)

The Agricultural Biotechnology major is a designed for students interested in careers as laboratory or research technicians in plant biotechnology, breeding, genetics, entomology, plant pathology, molecular biology, or physiology, as well as for students preparing for advanced degrees in these areas. The program emphasizes the development and application of new technology to ensure a safe and abundant food and fiber supply. Students may find employment in industry, government, or university labs.

First Year

<i>First Term</i>	<i>Hours</i>
CHEM 105 [PSCI]	4
ENGLISH 101 [WRTG]	3
HORT / CROP SCI 102	3
MATH 140 [QUAN]	4
<i>Second Term</i>	<i>Hours</i>
CHEM 106 [PSCI]	4

ECONS 101 [SSCI]	3
HISTORY 105 [ROOT]	3
HORT / CROP SCI 202	4

Second Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI] or 107 [BSCI]	4
COM 102 [COMM] or H D 205 [COMM]	3 or 4
STAT 212 [QUAN]	4
Electives	3
<i>Second Term</i>	<i>Hours</i>
BIOLOGY 106 or 107	4
Creative & Professional Arts [ARTS]	3
ENTOM 351	3
Humanities [HUM]	3
SOIL SCI 201	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 420	3
CHEM 345	4
ENTOM 343 [M]	3
MBIOS 301	4
PL P 429	3
<i>Second Term</i>	<i>Hours</i>
CROP SCI 445 [M]	4
CROP SCI 495	3
Diversity [DIVR]	3
MBIOS 303	4
MBIOS 305	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
HORT 480	3
MBIOS 404	3
MBIOS 478	3
STAT 412	3
Elective	4
<i>Second Term</i>	<i>Hours</i>
400-500-level Seminar in CAHNRS ¹	1
HORT 416 ²	3
Integrative Capstone [CAPS]	3
IPM 452	2
MBIOS 401	3

¹ Seminar in CAHNRS (1 credit): AGTM 451, CROP SCI /SOIL SCI 412, HORT/VIT ENOL 409, or as approved by advisor.

² CROP SCI 411 [M] can be taken in the fall as an alternative to HORT 416.

FIELD CROP MANAGEMENT (120 HOURS)

The Field Crop Management major is ideal for students interested in agronomy, crop production, and plant, soil, and pest management. Crop scientists (or agronomists) are involved in improving food, feed, and fiber production. Graduates qualify for careers in agribusiness, corporate and technical farm management, professional consulting, research, and sales positions.

First Year

<i>First Term</i>	<i>Hours</i>
CHEM 101 [PSCI] or 105 [PSCI]	4
ECONS 101 [SSCI]	3
HISTORY 105 [ROOT]	3
HORT / CROP SCI 102	3
MATH 140 [QUAN]	4

<i>Second Term</i>	<i>Hours</i>
CHEM 102 or 106	4
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3
HORT / CROP SCI 202	4

Second Year

<i>First Term</i>	<i>Hours</i>
[COMM] Course (COM 102 [COMM] or H D 205 [COMM] recommended)	3 or 4
BIOLOGY 106 [BSCI], 107 [BSCI], or 120 [BSCI]	4
Humanities [HUM]	3
SOIL SCI 201	3
Electives	2
<i>Second Term</i>	<i>Hours</i>
BIOLOGY 106, 107, or 120	4
ENTOM 351	3
STAT 212	4
Electives	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
CROP SCI 305	3
ECONS 350 ¹	3
ENTOM 343 [M]	3
Electives	3
Major Electives ²	3
<i>Second Term</i>	<i>Hours</i>
CROP SCI 302	3
CROP SCI 495, 498, or 499	3
Diversity [DIVR]	3
Electives	6

Fourth Year

<i>First Term</i>	<i>Hours</i>
CROP SCI 403	3
CROP SCI 411 [M] ³	3
Integrative Capstone [CAPS]	3
PL P 429	3
Major Electives ²	3
<i>Second Term</i>	<i>Hours</i>
CROP SCI 412	1
IPM 452	2
SOIL SCI 441	3
Electives	6
Major Electives ²	3

¹ ECONS 352 can be taken in the spring as an alternative to ECONS 350.

² Major Elective (9 Credits): AFS 302 [M]; CROP SCI 360, 401 [M], 445 [M], 495, 498, 499; ENTOM 361; HORT 357; SOIL SCI 442; and/or consult with your advisor.

³ HORT 416 can be taken in the spring as an alternative to CROP SCI 411 [M]. However, two [M] courses are required so one elective should have [M] designation.

FRUIT AND VEGETABLE MANAGEMENT (120 HOURS)

The Fruit and Vegetable Management major offers specialization in the science and practice of growing, harvesting, handling, storing, processing, and marketing tree fruits, small fruits, and vegetables. Students will learn the most efficient and sustainable management practices involving state-of-the-art production systems for the diverse fruit and vegetable crops produced in the Pacific Northwest and beyond. Graduates can look forward to careers as growers and farm managers, production field advisors, sales representatives in the horticultural services industry, managers of produce firms, and brokers and marketers of fruit and vegetable products.

First Year

<i>First Term</i>	<i>Hours</i>
CHEM 101 [PSCI] or 105 [PSCI]	4
ECONS 101 [SSCI] or 102 [SSCI]	3
HISTORY 105 [ROOT]	3
HORT / CROP SCI 102	3

<i>Second Term</i>	<i>Hours</i>
CHEM 102 or 106	4
ENGLISH 101 [WRTG]	3
HORT / CROP SCI 202	4
Humanities [HUM]	3
STAT 212 [QUAN], MATH 140 [QUAN], 171 [QUAN], or 202 [QUAN]	3 or 4

Second Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI] or 120 [BSCI]	4
[COMM] Course (COM 102 [COMM] or H D 205 [COMM] recommended)	3 or 4
Creative & Professional Arts [ARTS]	3
SOIL SCI 201	3

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 107	4
HORT 251	4
Sustainability Elective ¹	3
Electives	6
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 420	3
Diversity [DIVR]	3
ENTOM 343 [M]	3
HORT 310	3
HORT 313	3

<i>Second Term</i>	<i>Hours</i>
ENTOM 351	3
Environmental HORT Elective ²	3
HORT 416 ³	3
Electives	6

<i>Third Term</i>	<i>Hours</i>
(Summer Session) HORT 399	1

Fourth Year

<i>First Term</i>	<i>Hours</i>
HORT 320	3
HORT 418 [M]	3
Pest Management Elective ⁴	3

PL P 300 or PL P 429	2 or 3
Sustainability Elective ¹	3

<i>Second Term</i>	<i>Hours</i>
Advanced Fruit or Vegetable Elective ⁵	3
HORT 425 [M] [CAPS]	3
HORT/VIT ENOL 409 or CROP SCI/SOIL SCI 412	1
IPM 452	2
SOIL SCI 441	3
Electives	3

¹ Sustainability Elective courses: BIOLOGY 330, 372 [M]; ENVR SCI 101, 285, 469; SOIL SCI 101, 480; or as approved by advisor.

² Environmental Horticulture Elective courses: HORT 231, 232, 331, 332, 357; or as approved by advisor.

³ CROP SCI 411 [M] can be taken in the fall as an alternative to HORT 416.

⁴ Pest Management Elective courses: CROP SCI 305; PL P 300, 429; or as approved by advisor. Courses cannot be used to fulfill more than one major requirement.

⁵ Advanced Fruit or Vegetable Elective courses: HORT 413 or 421 [M], or as approved by advisor.

LANDSCAPE, NURSERY, AND GREENHOUSE MANAGEMENT (120 HOURS)

The Landscape, Nursery, and Greenhouse Management major is a horticulture-based program that prepares students for opportunities in landscape plant management and in the propagation, production, marketing, and use of potted crops, bedding plants, trees, shrubs, and cut flowers. This is an exciting major for students interested in owning or managing a nursery or greenhouse; attending graduate school in horticulture; working for university extension offices and research greenhouses, maintaining public gardens, arboretums, landscapes, and parks; or working as wholesale horticultural-product brokers. Students in this major are encouraged to gain hands-on experience and earn scholarships through participation in the Horticulture Club.

First Year

<i>First Term</i>	<i>Hours</i>
CHEM 101 [PSCI] or 105 [PSCI]	4
[COMM] Course (COM 102 [COMM] or H D 205 [COMM] recommended)	3 or 4
Creative & Professional Arts [ARTS]	3
HISTORY 105 [ROOT]	3
HORT / CROP SCI 102	3

<i>Second Term</i>	<i>Hours</i>
CHEM 102 or 106	4
ENGLISH 101 [WRTG]	3
HORT / CROP SCI 202	4
MATH 140 [QUAN], 171 [QUAN], 202 [QUAN], or STAT 212 [QUAN]	3 or 4

Second Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI], 107 [BSCI], or 120 [BSCI]	4
HORT 231	3

Humanities [HUM]	3
SOIL SCI 201	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
HORT 232	3
HORT 251	4
Social Sciences [SSCI]	3
Electives	4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106, 107, or 120	4
Diversity [DIVR]	3
ENTOM 343 [M]	3
Horticulture Electives ¹	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
Advanced Plant Science Elective ²	3 or 4
ENTOM 351	3
HORT 331	3
Horticulture Electives ¹	3
300-400-level Elective	3

<i>Third Term</i>	<i>Hours</i>
(Summer Session) HORT 399	1

Fourth Year

<i>First Term</i>	<i>Hours</i>
Advanced Plant Science Elective ²	3 or 4
PL P 300 or 429	2 or 3
Electives	9

<i>Second Term</i>	<i>Hours</i>
400-500-level Seminar in CAHNRS ³	1
HORT 357	3
HORT 416 ⁴	3
HORT 425 [M] [CAPS]	3
Horticulture Elective ¹	1
SOIL SCI 302 [M] or 441	3

¹ Approved Horticulture Electives (7 credits minimum): CROP SCI 301, 305, 401 [M]; HORT 310, 313, 320, 332, 358; or as approved by advisor.

² Advanced Plant Science Electives: BIOLOGY 301, 332 [M], 372 [M], 409, 462; CROP SCI/HORT 445 [M]; HORT 418 [M]; NATRS 300, 450 [M], 454 [M], 464 [M]; or as approved by advisor.

³ Seminar in CAHNRS (1 credit): AGTM 451, CROP SCI /SOIL SCI 412, HORT/VIT ENOL 409, or as approved by advisor.

⁴ CROP SCI 411 [M] can be taken in the fall as an alternative to HORT 416.

TURFGRASS MANAGEMENT (120 HOURS)

The Turfgrass Management major is geared toward students interested in pursuing careers as golf course managers, athletic field managers, or personnel managers in those venues. Students will take courses in turf management, turf production, plant pathology, entomology, soil fertility, and plant breeding to learn how to maintain healthy turfgrass systems. Additionally, students gain hands-on experience at the Palouse Ridge Golf Course, an 18-hole championship golfing facility at the Pullman campus.

First Year

<i>First Term</i>	<i>Hours</i>
CHEM 101 [PSCI]	4
[COMM] Course (COM 102 [COMM] or H D 205 [COMM] recommended)	3 or 4
ENGLISH 101 [WRTG]	3
HORT / CROP SCI 102	3

<i>Second Term</i>	<i>Hours</i>
CHEM 102	4
HISTORY 105 [ROOT]	3
HORT / CROP SCI 202	4
STAT 205 [QUAN] or 212 [QUAN]	3 or 4

Second Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI]	4
Diversity [DIVR]	3
ECONS 101 [SSCI]	3
SOIL SCI 201	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 107 or 120	4
Creative & Professional Arts [ARTS]	3
ENTOM 351	3
Humanities [HUM]	3
Electives	3
Complete Writing Portfolio	4

Third Year

<i>First Term</i>	<i>Hours</i>
AGTM 315	3
CROP SCI 301	3
CROP SCI 305	3
ECONS / BUSINESS Electives ¹	3
ENTOM 343 [M]	3

<i>Second Term</i>	<i>Hours</i>
AGTM 412	3
CROP SCI / HORT Elective ²	3
IPM 452	2
SOIL SCI 441	3
SOIL SCI 442	2

<i>Third Term</i>	<i>Hours</i>
(Summer Session) CROP SCI 495, 498, or 499	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
AGTM Electives ³	3
CROP SCI 411 [M] ⁴	3
PL P 429	3
Electives	6

<i>Second Term</i>	<i>Hours</i>
CROP SCI 401 [M]	3
CROP SCI 412	1
Integrative Capstone [CAPS]	3
Electives	8

¹ ECONS/BUSINESS Elective (3 credits): ACCTG 230; ECONS 350, 352; MGMT 301; and/or consult with your advisor.

² CROP SCI/HORT Elective (3 credits): CROP SCI 302; HORT 231, 232, 331; and/or consult with your advisor.

³ AGTM Electives (3 credits): AGTM 310, 314, 416; and/or consult with your advisor.

⁴ HORT 416 can be taken in the spring as an alternative to CROP SCI 411 [M].

VITICULTURE AND ENOLOGY (120 HOURS)

The Viticulture and Enology major was created for students interested in wine-grape growing and winemaking, as well as contributing to critical research and development opportunities in the wine industry. This program offers the technical, scientific, and practical experience needed to gain the essential skills for producing high quality grapes and premium table wines. It prepares students for successful careers in the wine industry in Washington and beyond.

First Year

<i>First Term</i>	<i>Hours</i>
CHEM 101 [PSCI] or 105 [PSCI]	4
[COMM] Course (COM 102 [COMM] or H D 205 [COMM] recommended)	3 or 4
HISTORY 105 [ROOT]	3
HORT / CROP SCI 102	3

<i>Second Term</i>	<i>Hours</i>
CHEM 102 or 106	4
ENGLISH 101 [WRTG]	3
HORT / CROP SCI 202	4
STAT 212 [QUAN]	4

Second Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI] or 120 [BSCI]	4
CHEM 345	4
ECONS 101 [SSCI] or 102 [SSCI]	3
VIT ENOL 113	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 107	4
Creative & Professional Arts [ARTS]	3
Diversity [DIVR]	3
Humanities [HUM]	3
SOIL SCI 201	3
Complete Writing Portfolio	4

Third Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 420	3
ENTOM 343 [M]	3
HORT/VIT ENOL 313	3
MBIOS 303	4
PL P 300 ¹	2

<i>Second Term</i>	<i>Hours</i>
ENTOM 351	3
HORT/VIT ENOL 413	3
IPM 452	2
MBIOS 305	3
Specialization Electives ²	3

<i>Third Term</i>	<i>Hours</i>
(Summer Session) VIT ENOL 399 or FS/VIT ENOL 496	2

Fourth Year

<i>First Term</i>	<i>Hours</i>
FS/VIT ENOL 465	3
HORT 418 [M]	3

HORT/VIT ENOL 326	3
HORT/VIT ENOL 409	1
Specialization Electives ²	3

<i>Second Term</i>	<i>Hours</i>
FS/VIT ENOL 422	3
FS/VIT ENOL 435	3
HORT 416 ³	3
HORT 425 [CAPS] [M]	3
Specialization Electives ²	3

¹ PL P 429 can be taken as an alternative, but PL P 300 is recommended.

² Approved Specialization Electives courses include (9 credits): AGTM 315; BIOLOGY 421; CHEM 220/222; CROP SCI 305, 403; ECONS 351; ENVR SCI 486; FS 303, 416, 423, 460, 462, 470; FS/VIT ENOL 466; GEOLOGY 322, 323; HBM 350, 358, 480; HORT 251, 421 [M], 495, 499; MATH 140; MBIOS 301, 306; MKTG 360; PHYSICS 101; SOIL SCI 302 [M], 374, 414, 415, 441, 442, 468; or as approved by advisor.

³ CROP SCI 411 [M] can be taken in the fall as an alternative to HORT 416.

Department of Integrative Physiology and Neuroscience

www.vetmed.wsu.edu/neuroscience/
Veterinary and Biomedical Research Bldg (VBR) 207
509-335-6624

Professor and Chair, S. Simasko; Regents Professors, J. M. Krueger, W. S. Ritter; Professors, M. Chandra, J. W. Harding, K. Mealey, J. Panksepp, R. C. Ritter, B. K. Slinker, B. A. Sorg; Associate Professors, S. Appleyard, R. L. Brown, W. Dong, R. Fuchs, H. Jansen, D. Lin, L. Sprunger, M. Varnum, A. Vasavada, G. Wayman; Assistant Professors, J. Davis, I. Karatsoreos, R. McLaughlin, J. Peters, D. Rossi, B. Tanner, J. Xu; Clinical Professor, P. Talcott; Clinical Assistant Professors, C. Faux, S. Gizerian, S. Lampa, P. Meighan, S. Meighan, P. D. Wilson.

The Department of Integrative Physiology and Neuroscience (IPN) offers a course of study leading to the degree of Doctor of Philosophy in Veterinary Science. This degree is designed to provide broad training in specific aspects of veterinary science and related disciplines to prepare students for careers in teaching, research, and service. The curriculum is research intensive emphasizing the acquisition of theoretical understanding of a field and or research skills in preparation for a career in teaching and research. The veterinary science degree allows for maximum flexibility within the curriculum. Students will design their degree plan in consultation with a faculty mentor, emphasizing the specialty fields of anatomy, pharmacology or physiology. It is required that a student contact and arrange for a faculty mentor prior to admission to the program.

The objectives for the Ph.D. level training are to prepare the candidate for a career as an independent investigator (i.e., can compete for extramural private and federal funds as the principal investigator).

Applicants are admitted directly into the Ph.D. from either a master's degree or bachelor's degree from

an accredited higher education institution. To be eligible for admission, candidates must meet general Washington State University requirements outlined in the Graduate Study Bulletin in effect at the time of their admission, as well as the current graduate veterinary science program requirements. Applicants for admission to the Graduate Program in Veterinary Science must have a minimum grade point average of 3.0 (A=4.0) either on the basis of the last 60 graded semester or 90 graded quarter hours of undergraduate study or basic science portion of a graduate or professional curriculum (usually the first 60 credit hours). Applicants will have completed courses in inorganic chemistry, organic chemistry, biochemistry, calculus, physics and a minimum of three courses in different areas of the biological sciences. It is advisable that applicants have a basic statistics course prior to entering the veterinary science program.

Applications for admission to the program must include a completed graduate school application form, GRE test scores (subject tests are not required), official transcripts for all college-level course work, three letters of recommendation from references capable of judging aptitude and capability for graduate study by the applicant, a statement by the applicant that describes career goals and research interests, a writing sample (3-5 pages in length on scientific subject matter. It could be a senior research project or a sole author science-based published paper), and a resume or curriculum vitae (CV). For students whose native language is not English, TOEFL scores are also required (minimum score is 100). Inquiries should be directed to the Program in Veterinary Science, Department Integrative Physiology and Neuroscience; Washington State University, Pullman, WA 99164-7620 or email grad.neuro@vetmed.wsu.edu.

Students normally begin their studies in the fall semester, which starts the latter part of August. Applicants are offered admission on a rolling basis, but may be notified of acceptance as late as April 15. Students may still apply for admission after December, but graduate stipends may not be available for late applicants.

Description of Courses

VETERINARY PHYSIOLOGY AND PHARMACOLOGY

VET PH

308 Functional Anatomy of Domestic Animals 4 (3-3) Course Prerequisite: BIOLOGY 107; junior standing. Macroscopic functional morphology of domestic animals.

499 Special Problems V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. Cooperative: Open to UI degree-seeking students. S, F grading.

505 Design and Analysis of Biomedical Experiments 4 Design of experiments with application to clinical and basic biomedical research; choosing, applying, and evaluating appropriate data analysis methods.

555 General and Cellular Physiology 4 (3-3) Physiochemical mechanisms of cellular function. (Crosslisted course offered as VET PH 555, PHARMSCI 555). Recommended preparation: Concurrent enrollment in MBIOS 513.

563 Deconstruction of Research 3 Course Prerequisite: Graduate standing in a WSU biomedical based graduate program. Nature and development of scientific investigation through oral and written avenues, and methods of critical analyses applied to questions of biomedical interest. (Crosslisted course offered as NEUROSCI 563, GLANHLTH 563, MBIOS 563, VET MICR 563, VET PATH 563, VET PH 563).

600 Special Projects or Independent Study V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. Cooperative: Open to UI degree-seeking students. S, F grading.

700 Master's Research, Thesis, and/or Examination V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Veterinary Science PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Interdisciplinary

Description of Courses

INTERDISCIPLINARY

INTERDIS

490 McNair Preparation for Graduate School 1 May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: Junior standing. Preparation for McNair Scholars and others for graduate study. No credit earned toward degree; not qualified for financial aid.

580 Leadership Development V 1-3 Course Prerequisite: By permission only. Meetings and workshops designed to develop professional and leadership skills for doctoral students.

590 Preparation for College Teaching 2 Cross-discipline instructional development for graduate teaching assistants; course development teaching techniques, university policies and procedures. S, F grading.

591 Interdisciplinary Studies 1 Contemporary issues in interdisciplinary education and research. Open to all interested students.

597 Preparing the Future Professoriate 2 Course Prerequisite: By permission only. Understanding and contextual knowledge of the professoriate and issues facing higher education.

598 Interdisciplinary Seminar 1 Course Prerequisite: INTERDIS 591 or admission to the IIDP program. Assists IIDP students in the preparation of their program proposal, which serves as the qualifying examination for continuation in the IIDP. The IIDP Graduate Committee will review and evaluate the proposal. S, F grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the IIDP PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Interior Design

Please see the School of Design and Construction in this catalog for information about Interior Design.

Landscape Architecture

Please see the School of Design and Construction in this catalog for information about Landscape Architecture.

Liberal Arts

www.libarts.wsu.edu

Description of Courses

LIBERAL ARTS

LIB A

497 Internship V 2-16 May be repeated for credit; cumulative maximum 16 hours. Course Prerequisite: Junior standing. Student experiential activities as paid or unpaid intern in business, education, non-profit, industry, or government organizations.

Program in Materials Science and Engineering

materials.wsu.edu

French Administration, Room 324
509-335-8231

Professors, A. Bandyopadhyay, S. Bose, G. S. Collins, I. Dutta, D. P. Field, Y. Gupta, K. W. Hipps, M. Kessler, M.G. Kuzyk, Y. Lin, K. G. Lynn, C. Mailhot, U. Mazur, M. D. McCluskey, J. L. McHale, M. S. Mesarovic, M. G. Norton, M. P. Wolcott, C. S. Yoo, H. Zbib, W. Zhong; Associate Professors, J. A. Brozik, A. E. Clark, S. L. Dexheimer, K. Englund, Y. Gu, Q. Li, J. McCloy, L. Scudiero, V. Yadama, J. W. Zhang; Assistant Professors, S. Banerjee, B. Collins, J. Leachman, D. Lee, M. Song, N. Wall.

Materials science includes the principles and practice of designing, synthesizing, characterizing, preparing, and fabricating useful materials. The Materials Science and Engineering Program accepts qualified bachelor's and master's graduates in the sciences and engineering who now wish to pursue graduate research for a Ph.D. in the area where the disciplines overlap. Materials science is an interdisciplinary program and this feature is emphasized in the research activities.

Requirements for the Materials Science Ph.D. include a minimum of 72 credit hours of which at least 21 hours are graded course work. The common ground for all participants in materials science is covered by the core of courses (15 credits) required of all students. The core provides a general overview to the field as well as advanced courses in thermodynamics, solid state physics, applied mathematics, and materials characterization. All students must attend the materials science seminar series (at least 6 credits), which provides an opportunity to find out the current research activities in the program and associated departments. After completion of the core of courses, students then select additional courses (a minimum of 6 credit hours) in areas that are applicable to their research program. These courses can come from any area of physical science, engineering, and mathematics.

All students complete an original research dissertation (MATSE 800). Minimum 20 credits. After admission to candidacy for the degree, students select a research supervisor from the materials science faculty. A broad spectrum of contemporary research areas is available.

Description of Courses

MATERIALS SCIENCE

MATSE

503 Current Topics in Materials Science V 1-3 May be repeated for credit. Recent advances and current research at the forefront of materials science.

505 Advanced Materials Science 3 Broad baseline in materials science including relationships between structure and properties. (Crosslisted course offered as MSE 505, MATSE 505). Cooperative: Open to UI degree-seeking students.

506 Biomaterials 3 Overview of the different types of materials used in biomedical applications such as implants and medical devices. Credit not granted for both MSE 406 and MSE 506. (Crosslisted course offered as MSE 506 and MATSE 506.)

513 Crystal Plasticity 3 Dislocation theory; slip; climb; mechanical properties of polycrystalline materials and application to important deformation processes. (Crosslisted course offered as MSE 513, ME 513, MATSE 513). Cooperative: Open to UI degree-seeking students.

516 Phase Transformations 3 Thermodynamics, nucleation, interface motion, mechanisms and kinetics of chemical reactions between solid metals and their environment. (Crosslisted course offered as MSE 516, MATSE 516). Cooperative: Open to UI degree-seeking students.

521 Statistics of Microstructures 3 Stereology, orientation and spatial distributions, percolation, measurement techniques and application to modeling of microstructures. (Crosslisted course offered as MSE 521, MATSE 521). Recommended preparation: MATH 540. Cooperative: Open to UI degree-seeking students.

538 Special Topics V 1-3 May be repeated for credit. Selected topics of current interest in advanced materials science.

571 Microscopic Analysis of Solid Surfaces 3 Modern spectroscopic methods for microscopic analysis of solid surfaces; emphasizes electron, ion, laser, and x-ray techniques.

593 Seminar in Materials Science 1 May be repeated for credit; cumulative maximum 6 hours. Presentation and discussion of topics in materials science taken from research in progress or current literature.

600 Special Projects or Independent Study V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Materials Science or the Materials Science and Engineering PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Department of Mathematics and Statistics

math.wsu.edu

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Professor and Department Chair, C. N. Moore; Professors, N. Dasgupta, R. H. Dillon, M. A. Evans, A. C. Genz, M. A. Jacroux, V. K. Jandhyala, A. Khapalov, L. Knott, H. Li, V. S. Manoranjan, J. McDonald, A. Panchenko, D. B. Slavitt, M. Tsatsomeris, D. S. Watkins, H. Yin; Associate Professors, T. Asaki, S. Cooper, A. Dimitrov, M. G. Hudelson, B. Krishnamoorthy, F. G. Pascual, L. Schreyer, M. F. Schumaker, E. Schwartz, K. Vixie; Assistant Professors, H. Dong, S. Karunakaran, S. Liu, L. F. New, N. Strigul, N. Voulgarakis, X. Wang, Y. Wang; Adjunct Professors, J. T. Coffey, K. D. Cooper; Clinical Associate Professors, H. D. Johnson, S. Lapin, K. Vincent; Senior Instructors: J. Martin, E. Remaley, D. Zhang; Professors Emeriti: J. R. Alldredge, K. A. Ariyawansa, D. C. Barnes, D. W. DeTemple, R. A. Johnson, M. J. Kallagher, D. C. Kent, J. E. Kucera, C. Long, C. B. Millham, R. Mifflin, S. C. Saunders, H. C. Wisner, W. A. Webb D. J. Wollkind.

The Department of Mathematics and Statistics provides undergraduate instruction and training in all major fields of mathematics and statistics. The numerous service courses taught by the department reflect the growing importance of mathematics and statistics in an increasing number of other disciplines.

Undergraduate training for mathematics majors is provided at WSU in the following five options: actuarial science, applied mathematics, secondary mathematics teaching with certification, secondary mathematics teaching without certification, and theoretical mathematics. The options prepare students for careers related to the respective fields. The mathematics major also prepares students for graduate study in such fields as business, economics, management science and computer science, as well as mathematics and statistics. Talented undergraduate majors in mathematics are given individual and small group instruction outside of class, sometimes resulting in research publications. A new, interdisciplinary undergraduate degree in data analytics is also available.

We expect that students graduating with either a mathematics degree or the new degree in data analytics will be able to: 1) use their mathematics and statistics skills within the context of a strong, fundamental general education, 2) use the fundamentals of the life and physical sciences, 3) apply a fundamental knowledge and practical understanding of mathematics and statistics, 4) continue learning in both traditional and non-traditional educational settings, and 5) communicate effectively.

All students who enroll in mathematics courses are responsible for satisfying the prerequisite(s). With only a few exceptions, WSU undergraduate students are required to take the WSU Math Placement Assessment (MPA) prior to enrolling in their first college-level mathematics course. See <http://www.math.wsu.edu/placement/welcome.php> placement for more information.

Graduate study and specialization are offered by the department in both classical and modern

areas of mathematics and statistics. A PhD student has four choices: a PhD in Mathematics, PhD in Mathematics-Applied Mathematics option, a PhD in Mathematics with an Education Emphasis, or a PhD in Mathematics-Statistics Option. The first involves doing mathematical research, the Applied Mathematics option focuses on applied mathematical research, the Education Emphasis option involves research on the teaching and learning of mathematics, and the Statistics option involves statistical research. Master's degrees in mathematics are available in the same four areas. Additionally, a Master's degree in Financial Mathematics is available. At the masters level the department offers the following degrees: a MS in Mathematics, MS in Mathematics-Applied Mathematics Option, MS in Mathematics-Computational Finance Option, and a MS in Statistics.

Preparation for Graduate Study

As preparation for work toward an advanced degree in mathematics or statistics, a student should have completed the equivalent of one of the schedules of study. Adequate opportunities are provided for removing deficiencies through the taking of appropriate courses. Students who contemplate undertaking studies leading to a doctoral degree should contact the Chair of the Mathematics Graduate Studies Committee (gradinfo@math.wsu.edu) for advice and assistance in the development of their plans.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

DATA ANALYTICS - ACTUARIAL SCIENCE OPTION (120 HOURS)

First Year

<i>First Term</i>	<i>Hours</i>
CPT S 115, CS 115, or STAT 115	3
CPT S 121, 131, or CS 121	4
ENGLISH 101 [WRTG]	3
MATH 171 [QUAN]	4

<i>Second Term</i>	<i>Hours</i>
CPT S 122, 132, or CS 122	4
ECONS 101 [SSCI]	3
HISTORY 105 [ROOT]	3
MATH 172	4
Elective	1

Second Year

<i>First Term</i>	<i>Hours</i>
B LAW 210	3
CPT S 215 or CS 215	3
ECONS 102 [SSCI]	3
MATH 220	2
STAT 360	3

<i>Second Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
CPT S 315 or CS 315	3

Creative & Professional Arts [ARTS]	3
FIN 350	3
STAT 380	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab ¹	4
CPT S 451 or CS 351	3
MATH 300 [M]	3
MATH 405	3
STAT 412, 423, or ECONS 311 [M] ²	3

<i>Second Term</i>	<i>Hours</i>
CPT S 415 or CS 415	3
Humanities [HUM]	3
Physical Sciences [PSCI] with lab ¹	4
STAT 436	3
Electives	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
Diversity [DIVR]	3
Foreign Language, if needed, or Electives	6
STAT 419	3
STAT 443	3

<i>Second Term</i>	<i>Hours</i>
CPT S 424 [CAPS] [M], CS 424 [CAPS] [M], or STAT 424 [CAPS] [M]	3
Foreign Language, if needed, or Electives	6
PHIL 450	3
STAT 446	3

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² Students who take STAT 412 or 423 will need to take an [M] course to fulfill major requirements.

DATA ANALYTICS - AGRICULTURE AND ENVIRONMENTAL SYSTEMS (120 HOURS)

First Year

<i>First Term</i>	<i>Hours</i>
CPT S 115 or STAT 115	3
CPT S 121 or 131	4
ENGLISH 101 [WRTG]	3
MATH 171 [QUAN]	4

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI]	4
CPT S 122 or 132	4
HISTORY 105 [ROOT]	3
MATH 172	4

Second Year

<i>First Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
CPT S 215	3
GEOLOGY 101 [PSCI]	4
MATH 220	2

SOIL SCI 201	3
STAT 360	3

<i>Second Term</i>	<i>Hours</i>
CPT S 315	3
Creative & Professional Arts [ARTS]	3
Humanities [HUM]	3
STAT 380	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
CPT S 451	3
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
SOIL SCI 368	3
STAT 412, 423, or ECONS 311 [M]	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
CPT S 415	3
SOIL SCI 374	3
SOIL SCI 468	4
STAT 436	3
Electives	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 372 [M], NATRS 464 [M], or SOIL SCI 302 [M]	3
Diversity [DIVR]	3
Foreign Language, if needed, or Electives	6
STAT 419	3

<i>Second Term</i>	<i>Hours</i>
CPT S 424 [CAPS] [M] or STAT 424 [CAPS] [M]	3
Foreign Language, if needed, or Electives	6
PHIL 450	3
Social Sciences [SSCI]	3

DATA ANALYTICS - BUSINESS OPTION (120 HOURS)

First Year

<i>First Term</i>	<i>Hours</i>
CPT S 115, CS 115, or STAT 115	3
CPT S 121, 131, or CS 121	4
ENGLISH 101 [WRTG]	3
MATH 171 [QUAN]	4
Elective	1

<i>Second Term</i>	<i>Hours</i>
CPT S 122, 132, or CS 122	4
ECONS 101 [SSCI]	3
HISTORY 105 [ROOT]	3
MATH 172	4
Elective	1

Second Year

<i>First Term</i>	<i>Hours</i>
ACCTG 230	3
COM 102 [COMM] or H D 205 [COMM]	3
CPT S 215 or CS 215	3
MATH 220	2
STAT 360	3

<i>Second Term</i>	<i>Hours</i>
CPT S 315 or CS 315	3
Creative & Professional Arts [ARTS]	3
Humanities [HUM]	3

MIS 250	3	CPT S 215	3	MATH 172	4
STAT 380	3	CPT S 350	3	Elective	1
Complete Writing Portfolio		MATH 220	2		
		STAT 360	3		

Third Year

<i>First Term</i>		<i>Second Term</i>		<i>First Term</i>	
	<i>Hours</i>		<i>Hours</i>		<i>Hours</i>
Biological Sciences [BSCI] with lab ¹	4	CPT S 315	3	Biological Sciences [BSCI] with lab ¹	4
CPT S 451 or CS 351	3	MATH 364	3	CPT S 215	3
MGMT 301	3	Physical Sciences [PSCI] with lab ¹	4	ECONS 102 [SSCI]	3
MIS 322 [M]	3	STAT 380	3	MATH 220	2
STAT 412, 423, or ECONS 311 [M]	3	Complete Writing Portfolio		STAT 360	3

Fourth Year

<i>First Term</i>		<i>Second Term</i>		<i>First Term</i>	
	<i>Hours</i>		<i>Hours</i>		<i>Hours</i>
Business Electives ²	3	Computation Elective ³	3	CPT S 451	3
Diversity [DIVR]	3	CPT S 415	3	Creative & Professional Arts [ARTS]	3
Foreign Language, if needed, or Electives	5	Diversity [DIVR]	3	Economics Elective ²	3
STAT 419	3	MATH 420	3	ECONS 302	3
		STAT 436	3	ECONS 311 [M]	3

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² Business Electives (6 credits): Approved courses include ACCTG 433 [M], FIN 427 [M], MGTOP 340, MGTOP 470, MIS 372 [M], or MKTG 368.

DATA ANALYTICS - COMPUTATION OPTION (120 HOURS)

First Year

<i>First Term</i>	
	<i>Hours</i>
CPT S 115 or STAT 115	3
CPT S 121 or 131	4
HISTORY 105 [ROOT]	3
MATH 171 [QUAN]	4
Elective	1

Second Term

<i>Second Term</i>	
	<i>Hours</i>
CPT S 122 or 132	4
ENGLISH 101 [WRTG]	3
Humanities [HUM]	3
MATH 172	4

Second Year

<i>First Term</i>	
	<i>Hours</i>
Biological Sciences [BSCI] with lab ¹	4
Communication [COMM] or Written Communication [WRTG]	3

DATA ANALYTICS - ECONOMICS OPTION (120 HOURS)

First Year

<i>First Term</i>	
	<i>Hours</i>
CPT S 115 or STAT 115	3
CPT S 121 or 131	4
ENGLISH 101 [WRTG]	3
MATH 171 [QUAN]	4

<i>Second Term</i>	
	<i>Hours</i>
CPT S 122 or 132	4
ECONS 101 [SSCI]	3
HISTORY 105 [ROOT]	3

Second Year

<i>Second Term</i>	
	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
CPT S 315	3
ECONS 301	3
Physical Sciences [PSCI] with lab ¹	4
STAT 380	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	
	<i>Hours</i>
CPT S 451	3
Creative & Professional Arts [ARTS]	3
Economics Elective ²	3
ECONS 302	3
ECONS 311 [M]	3

<i>Second Term</i>	
	<i>Hours</i>
CPT S 415	3
Economics Electives ²	6
Humanities [HUM]	3
STAT 436	3

Fourth Year

<i>First Term</i>	
	<i>Hours</i>
Diversity [DIVR]	3
Economics Elective ²	3
Foreign Language, if needed, or Electives	6
STAT 419	3

<i>Second Term</i>	
	<i>Hours</i>
CPT S 424 [CAPS] [M] or STAT 424 [CAPS] [M]	3
Foreign Language, if needed, or Electives	6
PHIL 450	3
STAT 443 ³	3

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² Economics Electives (12 credits; minimum 9 credits at the 400 level): Approved courses include ECONS 321, 323, 324, 327, 424, 425, 426, 451, 452, and 490.

³ ECONS 525 can be substituted for STAT 443.

DATA ANALYTICS - LIFE SCIENCES (120 HOURS)

First Year

<i>First Term</i>	
	<i>Hours</i>
CPT S 115 or STAT 115	3
CPT S 121 or 131	4
HISTORY 105 [ROOT]	3

MATH 171 [QUAN]	4	<i>Second Term</i>	<i>Hours</i>	<i>Second Term</i>	<i>Hours</i>
Elective	1	CHEM 105 [PSCI]	4	CPT S 122 or 132	4
<i>Second Term</i>	<i>Hours</i>	CPT S 122 or 132	4	ENGLISH 101 [WRTG]	3
CHEM 101 [PSCI]	4	ENGLISH 101 [WRTG]	3	MATH 172	4
CPT S 122 or 132	4	MATH 172	4	SOC 101 [SSCI]	3
ENGLISH 101 [WRTG]	3	Second Year		Elective	1
MATH 172	4	<i>First Term</i>	<i>Hours</i>	Second Year	
Second Year		CPT S 215	3	<i>First Term</i>	<i>Hours</i>
<i>First Term</i>	<i>Hours</i>	MATH 220	2	Biological Sciences [BSCI] with lab ¹	4
BIOLOGY 106 [BSCI]	4	MATH 273	2	CPT S 215	3
CPT S 215	3	PHYSICS 201	4	MATH 220	2
MATH 220	2	STAT 360	3	PSYCH 105 [SSCI]	3
Social Sciences [SSCI]	3	Elective	1	STAT 360	3
STAT 360	3	<i>Second Term</i>	<i>Hours</i>	<i>Second Term</i>	<i>Hours</i>
<i>Second Term</i>	<i>Hours</i>	CHEM 106	4	CPT S 315	3
BIOLOGY 107	3	CPT S 315	3	PHIL 101 [HUM] or 103 [HUM]	3
CHEM 102	4	PHYSICS 202	4	Physical Sciences [PSCI] with lab ¹	4
Communication [COMM] or Written		STAT 380	3	POL S 201	3
Communication [WRTG]	3	Elective	1	STAT 380	3
CPT S 315	3	Complete Writing Portfolio		Complete Writing Portfolio	
STAT 380	3	Third Year		Third Year	
Complete Writing Portfolio		<i>First Term</i>	<i>Hours</i>	<i>First Term</i>	<i>Hours</i>
Third Year		CHEM 330 or Elective ¹	1	Communication [COMM] or Written	
<i>First Term</i>	<i>Hours</i>	CHEM 331	3	Communication [WRTG]	3
BIOLOGY 301	3	Communication [COMM] or Written		CPT S 451	3
CPT S 451	3	Communication [WRTG]	3	Creative & Professional Arts [ARTS]	3
Creative & Professional Arts [ARTS]	3	CPT S 451	3	SOC 317 [M]	3
Humanities [HUM]	3	Creative & Professional Arts [ARTS]	3	STAT 412, 423, or ECONS 311 [M] ²	3
STAT 412, 423, or ECONS 311 [M] ¹	3	STAT 412, 423, or ECONS 311 [M]	3	<i>Second Term</i>	<i>Hours</i>
<i>Second Term</i>	<i>Hours</i>	<i>Second Term</i>	<i>Hours</i>	CPT S 415	3
BIOLOGY 340	3	CHEM 332	3	SOC 340 [DIVR]	3
CPT S 415	3	CHEM 333	1	Social Sciences Elective ³	3
Creative & Professional Arts [ARTS], Humanities		CPT S 415	3	STAT 436	3
[HUM], or Social Sciences [SSCI]	3	Humanities [HUM]	3	Electives	3
MBIOS 478	3	Social Sciences [SSCI]	3	Fourth Year	
STAT 436	3	STAT 436	3	<i>First Term</i>	<i>Hours</i>
Fourth Year		Fourth Year		Foreign Language, if needed, or Electives	6
<i>First Term</i>	<i>Hours</i>	<i>First Term</i>	<i>Hours</i>	Social Sciences Electives ³	6
BIOLOGY 335	3	Biological Sciences [BSCI]	3	STAT 419	3
Diversity [DIVR]	3	CHEM 334 [M]	2	<i>Second Term</i>	<i>Hours</i>
Foreign Language, if needed, or Electives	6	Diversity [DIVR]	3	CPT S 424 [CAPS] [M] or STAT 424 [CAPS] [M]	3
STAT 419	3	Foreign Language, if needed, or Electives	3 or 4	Foreign Language, if needed, or Electives	9
<i>Second Term</i>	<i>Hours</i>	STAT 419	3	PHIL 450	3
BIOLOGY 474	4	<i>Second Term</i>	<i>Hours</i>		
CPT S 424 [CAPS] [M] or STAT 424 [CAPS] [M]	3	CPT S 424 [CAPS] [M] or STAT 424 [CAPS] [M]	3		
Foreign Language, if needed, or Electives	4	Creative & Professional Arts [ARTS], Humanities			
PHIL 450	3	[HUM], or Social Sciences [SSCI]	3		
		Foreign Language, if needed, or Electives	6		
		PHIL 450	3		

¹ Students who choose STAT 412 or 423 will need to take an [M] course to fulfill University requirements.

DATA ANALYTICS - PHYSICAL SCIENCES (120 HOURS)

First Year

<i>First Term</i>	<i>Hours</i>
CPT S 115 or STAT 115	3
CPT S 121 or 131	4
HISTORY 105 [ROOT]	3
MATH 171 [QUAN]	4

¹ The University requires a minimum of 40 credits at the 300-400 level. CHEM 330 is recommended, but must be taken concurrently with CHEM 331.

DATA ANALYTICS - SOCIAL SCIENCES (120 HOURS)

First Year

<i>First Term</i>	<i>Hours</i>
CPT S 115 or STAT 115	3
CPT S 121 or 131	4
HISTORY 105 [ROOT]	3
MATH 171 [QUAN]	4

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² Students who choose STAT 412 or 423 will need to take an [M] course to fulfill University requirements.

³ Social Sciences Electives (6 credits): Approved courses include ED PSYCH 400, 404, POL S 416, and PSYCH 333.

MATHEMATICS (120 HOURS)

Mathematics Major Core Requirements

In addition to the UCORE requirements and

the College of Arts and Sciences requirements, a mathematics major is required to take 13 core courses and a minimum of 4 additional 300-400-level MATH courses specified by a chosen option. Options include: Actuarial Science, Applied Mathematics, Theoretical Mathematics. Courses required for the major may not be taken pass/fail, and a 2.0 minimum GPA is required.

Certification Requirements

Applications for certification are accepted at any time during fall and spring semesters. Decisions are made within ten working days of receipt of application. Application forms are available in the Mathematics Department office.

Applications are evaluated, and certification decided, by a faculty committee.

Applicants must have an overall GPA of at least 2.0.

The mathematics core consists of MATH 171, 172, and 220. These courses (or their equivalent for transfer students) must be completed before application.

Students with at least a 2.5 GPA in the mathematics core will be certified automatically. Those with less than a 2.0 GPA in the mathematics core will normally not be certified. Others will be considered on a case-by-case basis.

Appeals on certification decisions are considered by the department chairperson.

Students who are denied certification may reapply after completing at least 12 more semester hours, whereupon decisions are based on grades in mathematics, science, and computer science courses; cumulative grade point average and grade patterns; and a personal interview.

Certified students whose cumulative GPA or GPA in MATH courses numbered 171 and above falls below 2.0 for two consecutive semesters, or who are academically deficient, are subject to decertification.

Applications for recertification are handled in the same manner as certification applications for those previously denied.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab	4
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3
MATH 171 [QUAN]	4

<i>Second Term</i>	<i>Hours</i>
CPT S 121	4
HISTORY 105 [ROOT]	3
MATH 172	4
MATH 220	2
Social Sciences [SSCI] ¹	3

Second Year

<i>First Term</i>	<i>Hours</i>
Humanities [HUM]	3
MATH 273	2
MATH 301	3
PHYSICS 201 [PSCI]	4
Foreign Language, if necessary, or Elective ²	4

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI] ¹	3
MATH 315	3

MATH 360	3
MATH 398	1
Foreign Language, if necessary, or Elective ²	4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
Diversity [DIVR]	3
MATH 300 [M]	3
MATH 420	3
MATH Option Course ³	3
Electives ²	3

<i>Second Term</i>	<i>Hours</i>
ENGLISH 402 [WRTG] [M]	3
MATH 421 [M]	3
MATH Option Course ³	3
Electives ²	6

Fourth Year

<i>First Term</i>	<i>Hours</i>
MATH 401 [M]	3
MATH Option Course ³	3
Electives ²	9

<i>Second Term</i>	<i>Hours</i>
MATH 402 [M]	3
MATH 464 [CAPS]	3
Electives ²	9

¹ Actuarial Science Option students should take ECONS 101, 102.

² Suggested elective courses for students pursuing Actuarial Science Option include ACCTG 230 and 231, ECONS 101 and 102, FIN 325 and 350, and MATH 448, which provide additional background for actuarial exams. Note: A minor in Business Administration is required to take FIN 325 and 350.

³ Mathematics Options: Required option courses include: 1) Actuarial Science – MATH 416, 423, and 443; 2) Applied Math – a) MATH 364 and two of MATH 325, 416, 448, 453, 456, or 466; or b) CPT S 122, MATH 364, 448, and one of MATH 416, 440, or 466; or c) three of MATH 340, 415, 440, 448, and 486; 3) Theoretical Math – Three of MATH 302, 325, 403, 415, 441, or 453.

MATHEMATICS - SECONDARY TEACHING OPTION WITH CERTIFICATION (124 HOURS)

Mathematics Major Core Requirements

Courses required for the major may not be taken pass/fail, and a 2.0 minimum GPA is required.

Certification Requirements

Applications for certification are accepted at any time during fall and spring semesters. Decisions are made within ten working days of receipt of application. Application forms are available in the Mathematics Department office.

Applications are evaluated, and certification decided, by a faculty committee.

Applicants must have an overall GPA of at least 2.0.

The mathematics core consists of MATH 171, 172, and 220. These courses (or their equivalent for transfer students) must be completed before application.

Students with at least a 2.5 GPA in the mathematics core will be certified automatically. Those with less than a 2.0 GPA in the mathematics core will normally not be certified. Others will be considered on a case-by-case basis.

Appeals on certification decisions are considered by the department chairperson.

Students who are denied certification may reapply after completing at least 12 more semester hours, whereupon decisions are based on grades in mathematics, science, and computer science courses; cumulative grade point average and grade patterns; and a personal interview.

Certified students whose cumulative GPA or GPA in MATH courses numbered 171 and above falls below 2.0 for two consecutive semesters, or who are academically deficient, are subject to decertification.

Applications for recertification are handled in the same manner as certification applications for those previously denied.

Teaching and Learning Requirements

Secondary education teacher certification requires a consultation with and advisor from the Department of Teaching and Learning for approval and sequencing of TCH LRN courses.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab	4
ENGLISH 101 [WRTG]	3
Humanities [HUM]	3
MATH 171 [QUAN]	4

<i>Second Term</i>	<i>Hours</i>
HISTORY 105 [ROOT]	3
MATH 172	4
MATH 220	2
PSYCH 105 [SSCI]	3
Foreign Language, if necessary	0-4

Second Year

<i>First Term</i>	<i>Hours</i>
ENGLISH 201 [WRTG] or 301 [WRTG]	3
MATH 216	3
MATH 273	2
PHYSICS 201 [PSCI]	4
Foreign Language, if necessary	0-4

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
MATH 301	3
MATH 315	3
MATH 398	1
TCH LRN 301	3
Complete Writing Portfolio	

<i>Third Term</i>	<i>Hours</i>
(Summer) TCH LRN 317	2

Third Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
MATH 300 [M]	3
MATH 330	3
MATH 403	3
300-400-level MATH Elective	3

<i>Second Term</i>	<i>Hours</i>
Diversity [DIVR]	3

MATH 320	3
MATH 360 or 443	3
300-400-level MATH Elective	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
MATH 401 [M]	3
MATH 431	3
TCH LRN 464	3
TCH LRN 465	3
TCH LRN 466	2

<i>Second Term</i>	<i>Hours</i>
ED PSYCH 468	3
MATH 432 [CAPS]	3
TCH LRN 467 [M]	3
TCH LRN 469	2
TCH LRN 470	3

Fifth Year

<i>First Term</i>	<i>Hours</i>
TCH LRN 415 (Student Teaching)	16

MATHEMATICS - STATISTICS OPTION (120 HOURS)

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab	4
ENGLISH 101 [WRTG]	3
MATH 171 [QUAN]	4
Social Sciences [SSCI]	3

<i>Second Term</i>	<i>Hours</i>
CPT S 121	4
Creative & Professional Arts [ARTS]	3
HISTORY 105 [ROOT]	3
MATH 172 or 182	4
MATH 220 or 230	2-3

Second Year

<i>First Term</i>	<i>Hours</i>
Humanities [HUM]	3
MATH 273 or 283	2-3
PHYSICS 201 [PSCI]	4
STAT 360	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
Diversity [DIVR]	3
MATH 301	3
STAT 412 or 423	3
Electives	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
MATH 300 [M]	3
MATH 420	3
STAT 436	3
Foreign Language, if needed, and/or Electives	6

<i>Second Term</i>	<i>Hours</i>
ENGLISH 402 [WRTG] Communication [COMM] or Written Communication [WRTG]	3
STAT 419	3
STAT Option Course ¹	3
Foreign Language, if needed, and/or Electives	6

Fourth Year

<i>First Term</i>	<i>Hours</i>
MATH 401 [M]	3
MATH 416	3
STAT 443	3
STAT Option Course ¹	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
MATH 464 [CAPS]	3
STAT 456	3
STAT Option Course ¹	3
Electives	6

¹ Statistics Option (9 credits) Courses must be selected from STAT 380, 410, 422, 446, 447.

SECONDARY MATHEMATICS TEACHING OPTION WITHOUT CERTIFICATION (120 HOURS)

Mathematics Major Core Requirements

Courses required for the major may not be taken pass/fail, and a 2.0 minimum GPA is required.

Certification Requirements

Applications for certification are accepted at any time during fall and spring semesters. Decisions are made within ten working days of receipt of application. Application forms are available in the Mathematics Department office.

Applications are evaluated, and certification decided, by a faculty committee.

Applicants must have an overall GPA of at least 2.0.

The mathematics core consists of MATH 171, 172, and 220. These courses (or their equivalent for transfer students) must be completed before application.

Students with at least a 2.5 GPA in the mathematics core will be certified automatically. Those with less than a 2.0 GPA in the mathematics core will normally not be certified. Others will be considered on a case-by-case basis.

Appeals on certification decisions are considered by the department chairperson.

Students who are denied certification may reapply after completing at least 12 more semester hours, whereupon decisions are based on grades in mathematics, science, and computer science courses; cumulative grade point average and grade patterns; and a personal interview.

Certified students whose cumulative GPA or GPA in MATH courses numbered 171 and above falls below 2.0 for two consecutive semesters, or who are academically deficient, are subject to decertification.

Applications for recertification are handled in the same manner as certification applications for those previously denied.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab	4
HISTORY 105 [ROOT]	3
Humanities [HUM]	3
MATH 171 [QUAN]	4

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3

ENGLISH 101 [WRTG]	3
MATH 172	4
MATH 220	2
PSYCH 105 [SSCI]	3

Second Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
ENGLISH 201 [WRTG] or 301 [WRTG]	3
MATH 216	3
MATH 273	2
PHYSICS 201 [PSCI]	4

<i>Second Term</i>	<i>Hours</i>
Diversity [DIVR]	3
MATH 301	3
MATH 315	3
MATH 398	1
Electives	6
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
MATH 300 [M]	3
MATH 330	3
MATH 403	3
Foreign Language, if necessary, and/or Electives	6

<i>Second Term</i>	<i>Hours</i>
MATH 320 [M]	3
MATH 360 or 443	3
300-400-level MATH Electives ¹	3
Foreign Language, if necessary, and/or Electives	6

Fourth Year

<i>First Term</i>	<i>Hours</i>
MATH 401 [M]	3
MATH 431	3
Electives	9

<i>Second Term</i>	<i>Hours</i>
MATH 432 [CAPS]	3
300-400-level MATH Electives ¹	3
300-400-level Electives	3
Electives	6

¹ MATH Elective courses include any 3-credit 300-400-level MATH courses not required to fulfill a major requirement.

Minors

Mathematics

A mathematics minor requires a minimum of 19 hours including MATH 171, 172, and one of 220 or 273. An additional 9 hours of 300-400-level mathematics credits must be taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. Courses required for the minor may not be taken pass/fail and a minimum 2.0 GPA is required in all courses taken for the minor. MATH 303, 330, 351, 398, 425, and 431 do not count toward the minor.

Statistics

The minor in statistics requires a minimum of 18 credit hours. 9 hours of upper-division work must be 300-400-level and be taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. Courses required for the minor may not be taken pass/fail and a minimum 2.0 GPA is required in all courses. Required courses include STAT 360 or 370, STAT 412, 423 or 430; STAT 443, and 9 additional hours selected from STAT 410, 419, 422 (UIdaho), 428 (UIdaho), 436, 446, 444, and 456. Students majoring in mathematics under the Actuarial Sciences Option must take STAT 456.

Certificates

Certificate in Quantitative Biology

The certificate in quantitative biology requires 28 credit hours including MATH/BIOLOGY 340 and MATH/BIOLOGY 494. In addition to the two required courses, students must take at least 12 hours of courses in mathematics, statistics, or computer science of which at least 8 hours must be at the 300-level or above and at least 12 hours of life sciences courses of which at least 8 hours must be at the 300-level or above. A list of recommended courses is provided in the departments. The requirement for 300-level or above may include independent research credits. However, no more than 4 hours of S, F graded coursework (including MATH/BIOLOGY 494 and 499) may count towards the 28 credits. No more than 7 out of the 28 credits may be transfer credits. Students must earn a cumulative GPA of 2.5 and no less than a C for graded courses used to fulfill the requirements of the certificate. A faculty coordinator shall be designated to oversee the certificate approval process.

Description of Courses

MATHEMATICS

MATH

- 100 Basic Mathematics** 2 Course Prerequisite: A minimum ALEKS math placement score of 1%. Review of basic arithmetic and elementary algebra. No credit earned toward degree. S, F grading.
- 101 Intermediate Algebra** 3 Fundamental algebraic operations and concepts. No credit earned toward degree.
- 103 Algebra Methods and Introduction to Functions** 3 Course Prerequisite: MATH 100 with an S, MATH 101 with a C or better, or a minimum ALEKS math placement score of 40%. Fundamental algebraic operations and concepts, linear systems and inequalities, polynomial and rational functions, introduction to exponential and logarithmic functions.
- 105 [QUAN] Exploring Mathematics** 3 Course Prerequisite: MATH 101 with a C or better, MATH 103 with a C or better, or a minimum ALEKS math placement score of 45%. Nature and scope of modern mathematics, and its relationships to other disciplines.

106 College Algebra 3 Course Prerequisite: MATH 101 with a C or better, or MATH 103 with a C or better, or a minimum ALEKS math placement score of 70%. Graphs, properties and applications of polynomial, rational, exponential and logarithmic functions.

108 Trigonometry 2 Course Prerequisite: MATH 106 with a C or better. Graphs, properties and applications of trigonometric functions. Credit not normally granted for both MATH 108 and 107.

110 Mathematics Acceleration 1 (0-3) Course Prerequisite: A minimum ALEKS math placement score of 25%. Individualized instruction on mathematical skills to enhance the mathematical background necessary for success in one of MATH 103, 106, or 171. S, F grading.

111 Mathematics Tutorial for MATH 201 1 Course Prerequisite: Concurrent enrollment MATH 107. Student-centered group tutorial focusing on skill improvement for success in MATH 201. S, F grading.

115 Math 105 Tutorial 2 Tutorial for MATH 105 focusing on concept development and mastery; skill proficiency. S, F grading.

116 Math 106 Tutorial 2 Tutorial for MATH 106 focusing on concept development and mastery; skill proficiency. S, F grading.

140 [QUAN] Calculus for Life Scientists 4 (3-3) Course Prerequisite: MATH 106 with a C or better and MATH 108 with a C or better, or a minimum ALEKS math placement score of 80%. Enrollment not allowed if credit already earned for MATH 171, 202, or 206. Differential and integral calculus with emphasis on life science applications. Credit not granted for more than one of MATH 140, 171, 202, 206.

171 [QUAN] Calculus I 4 (3-3) Course Prerequisite: MATH 106 with a C or better and MATH 108 with a C or better, or a minimum ALEKS math placement score of 83%. Enrollment not allowed if credit already earned for MATH 140, 202, or 206. Differential and integral calculus of one variable with associated analytic geometry. Credit not normally allowed for more than one of MATH 140, 171, 202, 206.

172 Calculus II 4 (3-3) Course Prerequisite: MATH 171 with a C or better. Techniques and applications of one-variable calculus; estimations; series, derivative of a vector function. Credit not granted for both MATH 172 and 182.

182 Honors Calculus II 4 (3-3) Course Prerequisite: MATH 171 with a C or better; by department permission only. Single variable calculus, series, with emphasis on conceptual development and problem solving. Credit not granted for both MATH 172 and 182.

201 Mathematics for Business and Economics 3 Course Prerequisite: MATH 101 with a C or better, MATH 103 with a C or better, or a minimum ALEKS math placement score of 65%. Mathematical analysis using polynomial, exponential, and logarithmic functions; linear systems, linear programming and probability, for business and economic applications.

202 [QUAN] Calculus for Business and Economics 3 Course Prerequisite: MATH 106 with a C or better, MATH 201 with a C or better, or a minimum ALEKS math placement score of 80%. Enrollment not allowed if credit already earned for MATH 140, 171, or 206. Differential and integral calculus of the polynomial, exponential, and logarithmic functions. Credit not granted for more than one of MATH 140, 171, 202, 206.

216 Discrete Structures 3 Course Prerequisite: MATH 107 with a C or better, MATH 108 with a C or better, or MATH 140, 171, 172, 182, or 202. Discrete mathematics, trees, graphs, elementary logic, and combinatorics with application to computer science. Recommended preparation: Programming course.

220 Introductory Linear Algebra 2 Course Prerequisite: MATH 171 or concurrent enrollment. Elementary linear algebra with geometric applications. Credit not normally granted for more than one of MATH 220 and 230.

230 Honors Introductory Linear Algebra 3 Course Prerequisite: MATH 171 or concurrent enrollment. An introduction to linear algebra with an emphasis on conceptual development. Credit not normally granted for more than one of MATH 220 and 230.

251 Fundamentals of Elementary Mathematics I 3 (2-2) Course Prerequisite: MATH 101 with a C or better, MATH 103 with a C or better, MATH 106 with a C or better, or a minimum ALEKS math placement score of 45%. Comprehensive development of number systems emphasizing place-value, integers, rational numbers, and associated algorithms; methods of problem solving.

252 [QUAN] Fundamentals of Elementary Mathematics II 3 (2-2) Course Prerequisite: MATH 251 with a C or better. Inquiry-based approach to fundamental concepts: measurement, geometrical constructions, similarity, congruence, symmetry, probability, counting principles, measures of central tendency, and distributions. Required preparation: One year of high school geometry.

273 Calculus III 2 Course Prerequisite: MATH 172 with a C or better, or MATH 182 with a C or better. Calculus of functions of several variables. Credit not granted for both MATH 273 and 283.

283 Honors Calculus III 2 Course Prerequisite: MATH 182 or by department permission. Multivariable calculus with emphasis on conceptual development and problem solving. Credit not granted for both MATH 273 and 283.

300 [M] Mathematical Computing 3 (2-3) Course Prerequisite: MATH 220 or MATH 230. Examination of some current computer software for solving mathematical problems. Recommended preparation: MATH 315.

301 Introduction to Mathematical Reasoning 3 Course Prerequisite: MATH 220 with a C or better, or MATH 230 with a C or better. Mathematical arguments and the writing of proofs.

- 302 Theory of Numbers** 3 Course Prerequisite: MATH 172 with a C or better, or MATH 182 with a C or better; MATH 301 with a C or better. Divisibility properties of integers; congruences; Diophantine equations; quadratic residues.
- 303 [M] Geometry for the Middle School Teacher** 3 Course Prerequisite: MATH 252. Topics in 2D and 3D geometry including technology-based reasoning and exploration, deductive arguments, transformational and proportional reasoning, and non-Euclidean geometries.
- 315 Differential Equations** 3 Course Prerequisite: MATH 273 with a C or better or Math 283 with a C or better; and MATH 220 with a C or better or concurrent enrollment, or MATH 230 with a C or better or concurrent enrollment. Linear differential equations and systems; series, numerical and qualitative approaches; applications.
- 320 [M] Elementary Modern Algebra** 3 Course Prerequisite: MATH 220 with a C or better or MATH 230 with a C or better. Algebra as a deductive system; number systems; groups, rings, and fields.
- 325 Elementary Combinatorics** 3 Course Prerequisite: MATH 220 with a C or better or MATH 230 with a C or better. Introduction to combinatorial theory: counting methods, binomial coefficients and identities, generating functions, occurrence relations, inclusion-exclusion methods.
- 330 Methods of Teaching Secondary School Mathematics** 3 Course Prerequisite: MATH 301 or concurrent enrollment. New curricula and pedagogical techniques for secondary school mathematics.
- 340 Introduction to Mathematical Biology** 3 Course Prerequisite: MATH 140 with a C or better, or MATH 172 with a C or better, or MATH 182 with a C or better; BIOLOGY 101, BIOLOGY 102, BIOLOGY 106, or BIOLOGY 107. Mathematical biology and development of mathematical modeling for solutions to problems in the life sciences. (Crosslisted course offered as MATH 340, BIOLOGY 340).
- 351 Algebraic Thinking for the Middle School Teacher** 3 Course Prerequisite: MATH 252 with a C or better. Algebraic reasoning, classes of functions, translation among models, analytical rule, tables of data, context and coordinate graphs.
- 352 Probability and Data Analysis for Middle School Teachers** 3 Course Prerequisite: MATH 251; MATH 252. Probability and statistics in relation to middle school mathematics and real world problems through visualization, hands-on activities, and technology.
- 364 Principles of Optimization** 3 Course Prerequisite: MATH 202, MATH 220, or MATH 230. Algebra of linear inequalities; duality; graphs, transport networks; linear programming; special algorithms; nonlinear programming; selected applications.
- 375 Vector Analysis** 3 Course Prerequisite: MATH 315. Line integrals, gradient, curl, divergence; Stokes' theorem, potential functions.
- 398 Mathematical Snapshots** 1 Course Prerequisite: MATH 172 or MATH 182. Character, life work, and historical importance of mathematicians from various eras and branches of mathematics.
- 401 [M] Introduction to Analysis I** 3 Course Prerequisite: MATH 301 with a C or better. Properties of sets and sequences of real numbers; limits, continuity, differentiation and integration of functions; metric spaces.
- 402 [M] Introduction to Analysis II** 3 Course Prerequisite: MATH 401. Sequences of functions, power series, multivariable calculus, inverse and implicit function theorems, Lagrange multipliers, change of variable in multiple integrations.
- 403 Geometry for Secondary Teachers** 3 Course Prerequisite: MATH 301 with a C or better. Geometry as a deductive system of logic; postulational systems; projective and non-Euclidian geometries.
- 405 Introduction to Financial Mathematics** 3 Course Prerequisite: MATH 172 or 182. Introduction to financial mathematics including the basics of annuities, stocks, bonds, and financial derivatives.
- 415 Intermediate Differential Equations** 3 Course Prerequisite: MATH 315. Linear systems; qualitative theory (existence, uniqueness, stability, periodicity); boundary value problems; applications.
- 416 Simulation Methods** 3 Course Prerequisite: STAT 360; CPT S 121, CPT S 251, or MATH 300. Model formulation and simulation in business, industry, and government; simulation languages; analysis of simulation output; applications. Credit not granted for both MATH 416 and MATH 516. Required preparation must include probability and statistics and programming experience.
- 420 Linear Algebra** 3 Course Prerequisite: MATH 220 with a C or better, or MATH 230 with a C or better; MATH 301 with a C or better. Advanced topics in linear algebra including similarity transformations, canonical forms, bilinear forms.
- 421 [M] Algebraic Structures** 3 Course Prerequisite: MATH 301 with a C or better. Properties of algebraic structures and their homomorphisms, semi-groups, groups, rings, unique factorization domains, fields.
- 425 Conceptual Aspects of Mathematics** 3 Course Prerequisite: By instructor permission. Exploration of conceptual models for thinking about mathematical ideas; activities and discussions of mathematical thinking and instruction. (Crosslisted course offered as TCH LRN 425, MATH 425).
- 431 Intersections of Culture and Mathematics** 3 Course Prerequisite: MATH 301 with a C or better. Gender/race/ethnicity differences; social consequences; cultural influences on development and learning of mathematics; role of women, people of color in mathematics. Credit not granted for both MATH 431 and 531.
- 432 [CAPS] Mathematics for College and Secondary Teachers** 3 Course Prerequisite: MATH 301 with a C or better. Pre-algebra, algebra functions and geometry examined from an advanced perspective, for secondary and lower level college teachers.
- 440 Applied Mathematics I** 3 Course Prerequisite: MATH 315. Partial differential equations; Fourier series and integrals; Bessel functions; calculus of variations; vector calculus; applications. Credit not granted for both MATH 440 and MATH 540. Required preparation must include differential equations.
- 441 Applied Mathematics II** 3 Course Prerequisite: MATH 315. Complex variable theory including analytic functions, infinite series, residues, and conformal mapping; Laplace transforms; applications. Credit not granted for both MATH 441 and MATH 541. Required preparation must include differential equations.
- 448 Numerical Analysis** 3 Course Prerequisite: MATH 315; CPT S 121, CPT S 251, or MATH 300. Fundamentals of numerical computation; finding zeroes of functions, approximation and interpolation; numerical integration (quadrature); numerical solution of ordinary differential equations. (Crosslisted course offered as MATH 448, MATH 548, CPT S 430, CPT S 530). Required preparation must include differential equations and a programming course.
- 453 Graph Theory** 3 Course Prerequisite: MATH 220 or MATH 230. Graphs and their applications, directed graphs, trees, networks, Eulerian and Hamiltonian paths, matrix representations, construction of algorithms. (Crosslisted course offered as MATH 453, CPT S 453). Required preparation must include linear algebra. Required preparation must include linear algebra.
- 456 Introduction to Statistical Theory** 3 Course Prerequisite: STAT 430 or 443. Sampling distributions; hypothesis testing and estimation; maximum likelihood; likelihood ratio tests; theory of least squares; nonparametrics. (Crosslisted course offered as STAT 456, MATH 456). Recommended preparation: One 3-hour 400-level STAT or probability course.
- 464 [CAPS] Linear Optimization** 3 Course Prerequisite: MATH 273 or MATH 283. Linear and integer programming; optimization problems; applications to economic and military strategies; rectangular games; minimax theory.
- 466 Optimization in Networks** 3 Course Prerequisite: MATH 364. Formulation and solution of network optimization problems including shortest path, maximal flow, minimum cost flow, assignment, covering, postman, and salesman. Credit not granted for both MATH 466 and MATH 566. Required preparation must include linear programming.

- 486 Mathematical Modeling in the Natural Science** 3 Course Prerequisite: MATH 315. Development of mathematical models for solutions of problems in the physical and life sciences. Credit not granted for both MATH 486 and MATH 586. Required preparation must include differential equations.
- 490 Topics in Mathematics** V 1-3 May be repeated for credit; cumulative maximum 9 hours. Course Prerequisite: By instructor permission. Special topics in mathematics.
- 494 Seminar in Mathematical Biology** 1 May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: MATH 140 with a C or better, or MATH 172 with a C or better, or MATH 182 with a C or better; BIOLOGY 101, BIOLOGY 102, BIOLOGY 106, or BIOLOGY 107. Oral presentation of research approaches, research results and literature review of mathematical biology including mathematical modeling of biological systems. (Crosslisted course offered as MATH 494, BIOLOGY 494). Cooperative: Open to UI degree-seeking students. S, F grading.
- 497 Instructional Practicum** V 1-2 May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: By instructor permission. May be repeated for credit; cumulative maximum 2 hours. S, F grading.
- 499 Special Problems** V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 500 Proseminar** 1 May be repeated for credit; cumulative maximum 2 hours. S, F grading.
- 501 Real Analysis** 3 Metric spaces, convergence, continuous functions, infinite series, differentiation and integration of functions of one and several variables. Required preparation must include advanced calculus or real analysis.
- 502 Introduction to Functional Analysis** 3 Course Prerequisite: MATH 501. Normed linear spaces, Banach spaces, introduction to Hilbert space, linear operators. Required preparation: Advanced linear algebra.
- 503 Complex Analysis** 3 Course Prerequisite: MATH 501. Analytic functions, complex integration, Taylor and Laurent series, conformal mapping, Riemann surfaces and analytic continuation. Cooperative: Open to UI degree-seeking students.
- 504 Measure and Integration** 3 Course Prerequisite: MATH 501. Lebesgue measure, Lebesgue integration, differentiation, L spaces, general measure and integration, Radon-Nikodym Theorem, outer measure and product measures.
- 505 Abstract Algebra** 3 Groups, rings, fields, and homological algebra. Required preparation must include abstract algebra.
- 507 Advanced Theory of Numbers** 3 May be repeated for credit; cumulative maximum 6 hours. Analytic and algebraic number theory.
- 508 Topics in Applied Analysis** 3 Advanced treatment of applications using techniques from fundamental analysis, convexity, analytic function theory, asymptotics, and differential equations.
- 511 Advanced Linear Algebra** 3 Vector spaces, inner products, unitary equivalence, similarity, Jordan forms, normality, spectral theory, singular value decomposition, norms and inequalities. Required preparation must include advanced linear algebra.
- 512 Ordinary Differential Equations** 3 Existence of solutions; linear systems; qualitative behavior, especially stability; periodic solutions. Required preparation must include a year-long sequence in advanced calculus or real analysis. Cooperative: Open to UI degree-seeking students.
- 516 Simulation Methods** 3 Model formulation and simulation in business, industry, and government; simulation languages; analysis of simulation output; applications. Credit not granted for both MATH 416 and MATH 516. Required preparation must include probability and statistics and programming experience.
- 525 General Topology** 3 Sets, metric spaces, topological spaces; continuous mappings, compactness, connectedness, local properties, function spaces, and fundamental groups. Required preparation must include a year-long sequence in advanced calculus or real analysis. Cooperative: Open to UI degree-seeking students.
- 531 Intersections of Culture and Mathematics** 3 Gender/race/ethnicity differences; social consequences; cultural influences on development and learning of mathematics; role of women, people of color in mathematics. Credit not granted for both MATH 431 and 531.
- 532 Advanced Mathematical Thinking** 3 Course Prerequisite: Graduate standing in mathematics. Current theories about how humans learn to think mathematically at the advanced level.
- 533 Teaching College Mathematics** 1 May be repeated for credit; cumulative maximum 3 hours. Course Prerequisite: Graduate standing in Mathematics. Theory and practice of mathematics instruction at the collegiate level.
- 534 Theories of Learning in Mathematics** 3 Math learning theories, including behaviorism, information processing, constructivism, situated cognition, communities of practice; influence on teaching and learning mathematics.
- 535 Research Paradigms in Mathematics Education** 3 Course Prerequisite: MATH 534. Current research paradigms in math education research; critique research designs used in current mathematics education research article; design and carry out a research project.
- 536 Statistical Computing** 3 (2-3) Generation of random variables, Monte Carlo simulation, bootstrap and jackknife methods, EM algorithm, Markov chain Monte Carlo methods. (Crosslisted course offered as STAT 536, MATH 536). Recommended preparation: One 3-hour 400-level probability or STAT course. Cooperative: Open to UI degree-seeking students.
- 540 Applied Mathematics I** 3 Partial differential equations; Fourier series and integrals; Bessel functions; calculus of variations; vector calculus; applications. Credit not granted for both MATH 440 and MATH 540. Required preparation must include differential equations.
- 541 Applied Mathematics II** 3 Complex variable theory including analytic functions, infinite series, residues, and conformal mapping; Laplace transforms; applications. Credit not granted for both MATH 441 and MATH 541. Required preparation must include differential equations.
- 543 Approximation Theory** 3 Univariate polynomial and rational approximation techniques; approximation using splines and wavelets; selected topics in multivariate approximation; algorithms for approximation. Required preparation must include numerical analysis. Cooperative: Open to UI degree-seeking students.
- 544 Advanced Matrix Computations** 3 Advanced topics in the solution of linear systems and eigenvalue problems, including parallel matrix computations. (Crosslisted course offered as MATH 544, CPT S 531). Required preparation must include numerical analysis. Cooperative: Open to UI degree-seeking students.
- 545 Numerical Analysis of Evolution Equations** 3 Discretization and numerical solution of partial differential equations of evolution; stability, consistency, and convergence; shocks; conservation of forms. Required preparation must include numerical analysis.
- 546 Numerical Analysis of Elliptic PDEs** 3 Methods of discretizing elliptic partial differential equations and solving the resulting systems of equations; error analysis. Required preparation must include numerical analysis. Cooperative: Open to UI degree-seeking students.
- 548 Numerical Analysis** 3 Fundamentals of numerical computation; finding zeroes of functions, approximation and interpolation; numerical integration (quadrature); numerical solution of ordinary differential equations. (Crosslisted course offered as MATH 448, MATH 548, CPT S 430, CPT S 530). Required preparation must include differential equations and a programming course.
- 553 Graph Theory** 3 Graphs and their applications, directed graphs, trees, networks, Eulerian and Hamiltonian paths, matrix representations, construction of algorithms. (Crosslisted course offered as MATH 453, CPT S 453). Required preparation must include linear algebra. Required preparation must include linear algebra.

- 555 Topics in Combinatorics 3** May be repeated for credit; cumulative maximum 6 hours. Combinatorics, generating functions, recurrence relations, inclusion-exclusion, coding theory; experimental design, graph theory.
- 560 Partial Differential Equations I 3** Partial differential equations and other functional equations: general theory, methods of solution, applications. Required preparation must include a year-long sequence in advanced calculus or real analysis. Cooperative: Open to UI degree-seeking students.
- 561 Partial Differential Equations II 3** Course Prerequisite: MATH 560. Continuation of MATH 560.
- 563 Mathematical Genetics 3** Mathematical approaches to population genetics and genome analysis; theories and statistical analyses of genetic parameters. (Crosslisted course offered as MATH 563, BIOLOGY 566). Required preparation must include multivariate calculus, genetics, and statistics. Cooperative: Open to UI degree-seeking students.
- 564 Nonlinear Optimization I 3** Theory and algorithms for unconstrained nonlinear optimization problems, including line search, trust region, conjugate gradient, Newton and quasi-Newton methods. Required preparation must include advanced multivariate calculus, and a programming language. Recommended preparation: MATH 464, 544.
- 565 Nonlinear Optimization II 3** Course Prerequisite: MATH 564. Theory and algorithms for constrained linear and nonlinear optimization including interior point, quadratic programming, penalty, barrier and augmented Lagrangian methods.
- 566 Optimization in Networks 3** Formulation and solution of network optimization problems including shortest path, maximal flow, minimum cost flow, assignment, covering, postman, and salesman. Credit not granted for both MATH 466 and MATH 566. Required preparation must include linear programming.
- 567 Integer and Combinatorial Optimization 3** Theory and applications of integer and combinatorial optimization including enumerative, cutting plane, basis reduction, relaxation and matching methods. Required preparation must include linear optimization.
- 568 Statistical Theory I 3** Probability spaces, combinatorics, multidimensional random variables, characteristic function, special distributions, limit theorems, stochastic processes, order statistics. (Crosslisted course offered as STAT 548, MATH 568). Recommended preparation: Calculus III and one 3-hour 400-level probability course.
- 569 Statistical Theory II 3** Continuation of STAT 548. Statistical inferences; estimation and testing hypotheses; regression analysis; sequential analysis and nonparametric methods. (Crosslisted course offered as STAT 549, MATH 569). Recommended preparation: STAT 548.
- 570 Mathematical Foundations of Continuum Mechanics I 3** The basic mathematical theory of continuum mechanics and its relation to perturbation techniques and stability methods. Required preparation must include differential equations and advanced calculus or real analysis.
- 571 Mathematical Foundations of Continuum Mechanics II 3** Course Prerequisite: MATH 570. Continuation of MATH 570.
- 574 Topics in Optimization 3** May be repeated for credit; cumulative maximum 12 hours. Advanced topics in the theory and computing methodology in optimization with emphasis on real-life algorithmic implementations. Required preparation must include advanced multivariable calculus and a programming language. Cooperative: Open to UI degree-seeking students.
- 575 Asset Pricing in Financial Engineering 3** Mathematical methods for various models on valuation of stocks and options, with rigorous mathematical analysis on pricing and hedging techniques. Recommended preparation: Advanced calculus and some knowledge on differential equations.
- 576 Quantitative Risk Management 3** Fundamental concepts in modern risk theory and mathematical methods in quantitative risk management; coherent risk measures, volatility modeling, multivariate dependence analysis using copulas, risk aggregation and allocation, and extreme value theory.
- 579 Mathematical Modeling in the Biological and Health Sciences 3** Techniques, theory, and current literature in mathematical modeling in the biological and health sciences, including computational simulation. (Course offered as BIOLOGY 579, MATH 579).
- 581 Topics in Mathematics V 1-3** May be repeated for credit. Topics in mathematics. Cooperative: Open to UI degree-seeking students.
- 583 Topics in Applied Mathematics V 1-3** May be repeated for credit. Topics in applied mathematics. Cooperative: Open to UI degree-seeking students.
- 586 Mathematical Modeling in the Natural Science 3** Development of mathematical models for solutions of problems in the physical and life sciences. Credit not granted for both MATH 486 and MATH 586. Required preparation must include differential equations.
- 590 Topics in Mathematics Education V 1-3** May be repeated for credit; cumulative maximum 6 hours. Topics in mathematics education.
- 591 Seminar in Mathematical Biology 1** May be repeated for credit; cumulative maximum 10 hours. Current research in mathematical biology. S, F grading.
- 592 Seminar in Analysis 1** May be repeated for credit; cumulative maximum 10 hours. Current research in analysis. S, F grading.
- 593 Seminar in Combinatorics, Linear Algebra, and Number Theory 1** May be repeated for credit; cumulative maximum 10 hours. Current research in combinatorics, linear algebra, and number theory. S, F grading.
- 594 Mathematics Education Seminar 1** May be repeated for credit; cumulative maximum 10 hours. Current research in mathematics education. S, F grading.
- 597 Mathematics Instruction Seminar 1** May be repeated for credit; cumulative maximum 5 hours. Introduction to the teaching of university mathematics. S, F grading.
- 600 Special Projects or Independent Study V 1-18** May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 702 Master's Special Problems, Directed Study, and/or Examination V 1-18** May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.
- 800 Doctoral Research, Dissertation, and/or Examination V 1-18** May be repeated for credit. Course Prerequisite: Admitted to the Mathematics PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

STATISTICS

STAT

- 115 Introduction to Data Analytics 3** Basic concepts, principles, and tools used in data analytics. (Crosslisted course offered as CPT S 115, CS 115, STAT 115).
- 205 [QUAN] Statistical Thinking 3** Course Prerequisite: MATH 101 with a C or better, MATH 103 with a C or better, or a minimum ALEKS math placement score of 45%. Scientific explanation; correlations and causality; presenting statistical evidence; graphical and numerical methods; chance and gambling; the bell-shaped distribution.
- 212 [QUAN] Introduction to Statistical Methods 4 (3-2)** Course Prerequisite: MATH 101 with a C or better, MATH 103 with a C or better, or MATH 106, 108, 140, 171, 201, or a minimum ALEKS math placement score of 45%. Introduction to descriptive and inferential statistics: t-tests, chi-square tests, one-way ANOVA, simple linear regression and correlation.

- 360 Probability and Statistics 3** Course Prerequisite: MATH 172 or MATH 182. Probability models, sample spaces, random variables, distributions, moments, comparative experiments, tests, correlation and regression in engineering applications. Credit not granted for both STAT 360 and 370. Cooperative: Open to UI degree-seeking students.
- 370 Introductory Statistics for Engineers 3** Course Prerequisite: MATH 172 or MATH 182. Probability axioms, probability models, random variables, expectation, confidence intervals, hypothesis testing, analysis of variance, control charts. Credit not granted for both STAT 360 and 370.
- 380 Decision Making and Statistics 3** Course Prerequisite: MATH 171 or 202. Concepts and methods of decision science using simple mathematical, statistical and computer based tools to solve complex problems for sound decision making.
- 410 Topics in Probability and Statistics 3** May be repeated for credit; cumulative maximum 6 hours. Current topics in probability and statistics of mutual interest to faculty and students. Credit not granted for both STAT 410 and STAT 510. Recommended preparation: One 3-hour 300-level STAT course.
- 412 Statistical Methods in Research I 3** Course Prerequisite: STAT 212, MATH 140, 171, 202, or graduate standing. Intermediate statistical methods, design and analysis of research studies: completely randomized and randomized block designs, multiple regression, categorical data analysis. Cooperative: Open to UI degree-seeking students.
- 419 Introduction to Multivariate Statistics 3** Course Prerequisite: MATH 220; one 300-400-level STAT. Introductory course covering multidimensional data, multivariate normal distribution, principal components, factor analysis, clustering, and discriminant analysis.
- 422 Sampling Methods 3** Course Prerequisite: STAT 212, 360, or 370. Simple and stratified random sampling; systematic sampling; cluster sampling; double sampling, area sampling. Cooperative: Open to UI degree-seeking students.
- 423 Statistical Methods for Engineers and Scientists 3** Hypothesis testing; linear, multilinear, and nonlinear regression; analysis of variance for designed experiments; quality control; statistical computing. Credit not normally granted for both STAT 423 and 430. Recommended preparation: One 3-hour 300-level STAT course.
- 424 [CAPS] [M] Data Analytics Capstone 3** Course Prerequisite: Junior standing. Team-based project that integrates the main aspects of data analytics. (Crosslisted course offered as CPT S 424, CS 424, STAT 424).
- 430 Statistical Methods in Engineering 3** Course Prerequisite: MATH 172 or 182; MATH 220. Random variables, sampling, hypothesis testing; linear, multilinear, and nonlinear regression; analysis of variance for designed experiments; statistical computing.
- 436 Statistical Computing with SAS and R 3 (2-2)** Course Prerequisite: One 300-400-level STAT. Introduction to the SAS and R statistical software packages; covers data entry, variable creation, debugging, graphics, and basic statistical methods.
- 443 Applied Probability 3** Course Prerequisite: MATH 172 or MATH 182; MATH 220 or MATH 230. Axioms of probability theory; random variables; expectation; generating function; law of large numbers; central limit theorem; Markov chains.
- 446 Statistical Applications in Insurance 3** Course Prerequisite: STAT 443. Introduction to the application of mathematics and statistics to the insurance field with a focus on actuarial science.
- 447 Introduction to Time Series Analysis 3** Course Prerequisite: STAT 423. Introduction to the analysis and application of time series including AR, MA, ARMA, and ARIMA models.
- 456 Introduction to Statistical Theory 3** Course Prerequisite: STAT 430 or 443. Sampling distributions; hypothesis testing and estimation; maximum likelihood; likelihood ratio tests; theory of least squares; nonparametrics. (Crosslisted course offered as STAT 456, MATH 456). Recommended preparation: One 3-hour 400-level STAT or probability course.
- 508 Environmental Spatial Statistics 3** Theoretical introduction and practical training in spatial data analysis for graduate students in the environmental sciences. (Crosslisted course offered as SOIL SCI 508, STAT 508). Required preparation must include undergraduate statistics through applied multiple regression. Cooperative: Open to UI degree-seeking students.
- 510 Topics in Probability and Statistics 3** May be repeated for credit; cumulative maximum 6 hours. Current topics in probability and statistics of mutual interest to faculty and students. Credit not granted for both STAT 410 and STAT 510. Recommended preparation: One 3-hour 300-level STAT course.
- 512 Analysis of Variance of Designed Experiments 3 (2-2)** Principles of experimental design and analysis and interpretation of data. Recommended preparation: One 3-hour 300-level STAT course.
- 516 Time Series 3** ARIMA models; identification, estimation, diagnostics, and forecasting; seasonal adjustments, outlier detection, intervention analysis and transfer function modeling. (Crosslisted course offered as MGTOP 516, STAT 516). Recommended preparation: STAT 443. Cooperative: Open to UI degree-seeking students.
- 519 Applied Multivariate Analysis 3** Multivariate normal distribution, principal components, factor analysis, discriminant function, cluster analysis, Hotteling's T2 and MANOVA. (Crosslisted course offered as MGTOP 519, STAT 519). Recommended preparation: STAT 443.
- 520 Statistical Analysis of Qualitative Data 3** Binomial, Poisson, multinomial distribution; contingency tables, Fisher's tests, log-linear models; ordinal data; applications in biology, business, psychology, and sociology. Recommended preparation: Linear Algebra or Calculus I and one 3-hour 300-level STAT course. Cooperative: Open to UI degree-seeking students.
- 522 Biostatistics and Statistical Epidemiology 3** Rigorous approach to biostatistical and epidemiological methods including relative risk, odds ratio, cross-over designs, survival analysis and generalized linear models. Recommended preparation: Linear Algebra or Calculus I and one 3-hour 300-level STAT course. Cooperative: Open to UI degree-seeking students.
- 523 Statistical Methods for Engineers and Scientists 3** Hypothesis testing; linear, multilinear, and nonlinear regression; analysis of variance for designed experiments; quality control; statistical computing. Credit not normally granted for both STAT 423 and 430. Recommended preparation: One 3-hour 300-level STAT course.
- 530 Applied Linear Models 3 (2-2)** The design and analysis of experiments by linear models. Recommended preparation: One 3-hour 300-level STAT course.
- 533 Theory of Linear Models 3** Theoretical basis of linear regression and analysis of variance models; a unified approach based upon the generalized inverse. Recommended preparation: Linear Algebra and one 3-hour 400-level STAT theory course. Cooperative: Open to UI degree-seeking students.
- 535 Regression Analysis 3** Conceptual development of regression; estimation, prediction, tests of hypotheses, variable selection, diagnostics, model validation, correlation, and nonlinear regression. Recommended preparation: One 3-hour 400-level STAT course. Cooperative: Open to UI degree-seeking students.
- 536 Statistical Computing 3 (2-3)** Generation of random variables, Monte Carlo simulation, bootstrap and jackknife methods, EM algorithm, Markov chain Monte Carlo methods. (Crosslisted course offered as STAT 536, MATH 536). Recommended preparation: One 3-hour 400-level probability or STAT course. Cooperative: Open to UI degree-seeking students.
- 544 Applied Stochastic Processes 3** Poisson and Markov processes; queuing theory; auto-covariance; stationarity; power spectra; harmonic analysis; linear mean-square predictions. Recommended preparation: One 3-hour 400-level STAT or Applied Probability course. Cooperative: Open to UI degree-seeking students.

548 Statistical Theory I 3 Probability spaces, combinatorics, multidimensional random variables, characteristic function, special distributions, limit theorems, stochastic processes, order statistics. (Crosslisted course offered as STAT 548, MATH 568). Recommended preparation: Calculus III and one 3-hour 400-level probability course.

549 Statistical Theory II 3 Continuation of STAT 548. Statistical inferences; estimation and testing hypotheses; regression analysis; sequential analysis and nonparametric methods. (Crosslisted course offered as STAT 549, MATH 569). Recommended preparation: STAT 548.

556 Introduction to Statistical Theory 3 Sampling distributions; hypothesis testing and estimation; maximum likelihood; likelihood ratio tests; theory of least squares; nonparametrics. (Crosslisted course offered as STAT 456, MATH 456). Recommended preparation: One 3-hour 400-level STAT or probability course.

565 Analyzing Microarray and Other Genomic Data 3 Statistical issues from pre-processing (transforming, normalizing) and analyzing genomic data (differential expression, pattern discovery and predictions). Recommended preparation: Linear Algebra and one 3-hour 300-level STAT course. Cooperative: Open to UI degree-seeking students.

572 Quality Control 3 Simple quality assurance tools; process monitoring; Shewhart control charts; process characterization and capability; sampling inspection; factorial experiments. Recommended preparation: One 3-hour 300-level STAT or probability course.

573 Reliability 3 Probabilistic modeling and inference; product-limit estimator; probability plotting; maximum likelihood estimation with censored data; regression models for accelerated life testing. Recommended preparation: One 3-hour 300-level STAT or probability course.

590 Statistical Consulting Practicum V 1-2 May be repeated for credit; cumulative maximum 6 hours. Theory and practice of statistical consulting, participation in consulting session. Recommended preparation: STAT 512 and STAT 530. S, F grading.

600 Special Projects or Independent Study V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.

702 Master's Special Problems, Directed Study, and/or Examination V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

School of Mechanical and Materials Engineering

www.mme.wsu.edu

Sloan 201

509-335-8654

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The School of Mechanical and Materials Engineering offers programs in Mechanical Engineering (Pullman, Bremerton, and Everett campuses), and Materials Science and Engineering (Pullman). Each program is detailed as follows.

MECHANICAL ENGINEERING

Mechanical engineering is concerned with (a) the use and economical conversion of energy from natural sources into other useful energy to provide power, light, heat, cooling and transportation, (b) the design and production of machines to lighten the burden of human work, (c) the creative planning, development and operation of systems for using energy, machines and resources, and (d) the processing of materials into products useful to people. Employment opportunities for graduates exist in the areas of mechanical design, systems design, equipment development, manufacturing, CAD/CAM, project engineering, production management, applied research, and sales and service.

The mission of the mechanical engineering program is to provide a broad education in mechanical engineering that prepares our students for being successful in professional practice and advanced studies. The educational objectives of the undergraduate mechanical engineering program are as follows: (1) graduates will be involved in the practice of engineering or in pursuit of graduate studies; (2) graduates will perform successfully as members of professional teams in the global arena; and (3) graduates will function professionally and continuously improve their professional skills.

The undergraduate curriculum emphasizes foundation courses at the third year which are fundamental to all aspects of mechanical engineering. These courses emphasize both analysis and design while accompanying laboratory courses provide opportunities for hands-on experiences. Computer applications are interwoven throughout the program. The courses in the fourth year emphasize the integration of fundamental engineering principles into various applications in mechanical engineering. The students also take two electives tailored to their interests and career goals. The undergraduate program is completed

with courses in integrated design of mechanical and thermal systems as well as a capstone laboratory course. Graduates are prepared to enter the field as engineers or to continue into a graduate program. An engineering internship program is available for students to gain industrial experience during their academic careers.

Student Learning Outcomes

The learning outcomes of the mechanical engineering undergraduate program are the following:

- Firm foundation and knowledge of mathematics, statistics, science and engineering principles and the ability to apply this knowledge for solving problems.
- Ability to design and conduct experiments and the ability to analyze the data, interpret results and draw conclusions.
- Ability to design thermal and mechanical components, systems or processes to meet desired needs and imposed constraints.
- Ability to work in multidisciplinary teams.
- Ability to identify, formulate and solve problems encountered in the practice of mechanical engineering.
- Understanding of professional and ethical responsibility.
- Ability to communicate effectively orally and in writing.
- Ability to understand the global and societal impacts of engineering decisions.
- Recognition of the need for, and an ability to engage in life-long learning.
- Knowledge of contemporary issues.
- Ability to use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.

The School offers courses of study leading to the degrees of Bachelor of Science in Mechanical Engineering (accredited by the Accrediting Board for Engineering and Technology), Master of Science in Mechanical Engineering, and Doctor of Philosophy (Mechanical Engineering). The school participates in the interdisciplinary programs leading to the Master of Science in Engineering and Doctor of Philosophy (Engineering Science).

MATERIALS SCIENCE AND ENGINEERING

The mission of the materials science and engineering program is to provide excellence in education, research, and service in the field of Materials Science and Engineering through educational programs that graduate students with strong backgrounds in scientific and engineering problem-solving methods. Materials science and engineering is the application of methods and principles of the pure sciences to study engineering materials. The undergraduate program focuses on (a) the relationship of the microscopic structure, e.g. crystal structure and defects to the macroscopic properties of materials, e.g. strength, (b) experimental techniques for characterizing physical, chemical and structural properties of materials, and (c) design and selection of appropriate materials for given engineering applications.

The specific fields of application covered by research and instruction programs can be expressed by the nominal designations of metals (metallurgy), polymers, ceramics, electronic materials, biomaterials, and composites. Due to the diversity

of useful properties encountered in materials engineering, attention must be given to application and peculiarities of these specific types of materials. Where possible, however, a generalized approach toward the study of materials, their properties, their selection, and their utilization is fostered. The broad-based instructional approach prepares graduates for careers in a wide range of industrial settings, from aerospace companies to corporations specializing in the production of solid state electronics. In addition, the undergraduate curriculum prepares students for continued education at the graduate level.

The educational objectives of the undergraduate materials science and engineering program are as follows: (1) graduates will be involved in the practice of engineering or in pursuit of graduate studies; (2) graduates will perform successfully as members of professional teams in the global arena; and (3) graduates will function professionally and continuously improve their professional skills.

The School offers courses of study leading to the degrees of Bachelor of Science in Materials Science and Engineering (accredited by the Accrediting Board for Engineering and Technology) and the Master of Science in Materials Science and Engineering. The school participates in the interdisciplinary programs leading to the Doctor of Philosophy (Engineering Science, Materials Science and Engineering).

Student Learning Outcomes

The learning outcomes of the materials science and engineering undergraduate program are the following:

- An ability to apply knowledge of mathematics, science, and engineering.
- An ability to design and conduct experiments, as well as to analyze and interpret data.
- An ability to design a system, component, or process to meet desired needs.
- An ability to function on multi-disciplinary teams.
- An ability to identify, formulate, and solve engineering problems.
- An understanding of professional and ethical responsibility.
- An ability to communicate effectively.
- The broad education necessary to understand the impact of engineering solutions in a global and societal context.
- A recognition of the need for, and an ability to engage in life-long learning.
- A knowledge of contemporary issues.
- An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
- An ability to apply advanced science (such as chemistry and physics) and engineering principles to materials systems.
- An integrated understanding of the scientific and engineering principles underlying the above for major elements of the field, viz. structure, properties, processing and performance related to materials systems appropriate to the field.
- An ability to apply and integrate knowledge from each of the above four elements of the field to solve materials selection and design problems.
- An ability to utilize experimental, statistical and computational methods consistent with the goals of the program.

TRANSFER STUDENTS

The School of Mechanical and Materials Engineering cooperates with the community colleges in Washington to minimize problems associated with transfer. Inquiries are welcome. A strong preparation in mathematics, physics, and chemistry is strongly recommended prior to transfer to minimize the time required at Washington State University to complete the bachelor's degree requirements.

The certification into the mechanical engineering or materials science and engineering programs is processed by the School. The certification requirements are described in the WSU catalog. Details for certification can also be obtained by contacting the School directly.

GRADUATE STUDY

Applicants should have a Bachelor of Science degree from an accredited program in mechanical engineering or materials science and engineering. Students with bachelor degrees in other engineering disciplines, mathematics, and the physical sciences are routinely admitted but may be required to meet additional course requirements.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

MATERIALS SCIENCE AND ENGINEERING (120 HOURS)

Criteria for Certification – Materials Science and Engineering Program

The School for Mechanical and Materials Engineering will establish the total number of students to be certified into the Materials Science and Engineering program.

Students should apply for certification in the semester after they have completed the following five courses: MATH 171, MATH 172, CHEM 105, CHEM 106, and PHYSICS 201. Students must have a minimum 2.5 cumulative GPA and a C or better grade for each of the five courses listed above to be considered for certification. Transfer students who meet the aforementioned minimum requirements may apply during their first semester at WSU, but no decision will be made until the end of the semester when the final grades become available.

Students need to submit an application for certification to the Undergraduate Student Services office, Sloan 205 or electronically to newcoug@mme.wsu.edu. The application deadline is the Monday after finals week in December and May for the fall and spring semester respectively.

The applicants will be ranked based on the average GPA of the math, science, and engineering courses completed. For those who are borderline, the semester and cumulative GPA will be considered and used as a reference. In addition to GPA, other factors may also be taken into consideration, such as the number of math science, and engineering courses taken at WSU. The committee has the authority to weigh these factors in its decision for certification.

Students who are deficient under the University's Academic Regulations are subject to decertification. The undergraduate studies committee will determine the eligibility and probation conditions for decertified students who will be permitted to apply for recertification.

Any further questions should be addressed to the Undergraduate Student Services office located in Sloan 205 or to newcoug@mme.wsu.edu.

First Year

<i>First Term</i>	<i>Hours</i>
CHEM 105 [PSCI]	4
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3
MATH 171 [QUAN]	4
MSE 110	2

<i>Second Term</i>	<i>Hours</i>
Biological Sciences [BSCI]	3
CHEM 106	4
HISTORY 105 [ROOT]	3
MATH 172	4
PHYSICS 201	4

Second Year

<i>First Term</i>	<i>Hours</i>
CE 211	3
Humanities [HUM]	3
MATH 220	2
MATH 273	2
MSE 201	3
PHYSICS 202	4

<i>Second Term</i>	<i>Hours</i>
CE 215	3
CPT S 121 or E E 221	2 - 4
Diversity [DIVR]	3
ECONS 102 [SSCI]	3
MATH 315	3
ME 220	1
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
E E 304	2
MSE 302	3
MSE 316	3
MSE 320 [M]	3
MSE 402	3
STAT 360 or 370	3

<i>Second Term</i>	<i>Hours</i>
ME 310	2
MSE 321	3
MSE 323	2
MSE 401	3
MSE 403	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
ME 416 [CAPS]	3
MSE 413	3
MSE 425 [M]	3
Engineering and Science Elective ¹	3

<i>Second Term</i>	<i>Hours</i>
ENGLISH 402 [WRTG] [M]	3
MSE Elective ²	3
Technical Elective ³	3
Engineering and Science Elective ¹	3

¹ Six credits from BIOLOGY 301, BIO ENG 481, CE 341, CHEM 331, 332, 345, 346, 347, E E 214, ME 212, 303, 304, 313, 316, 348, 414, 449, 461, 472, PHYSICS 303, 304, 463, MBIOS 303, any 400 or 500-level MSE (except Integrated Capstone course in MSE), or any 500-level ME .

² Any 400 or 500-level MSE course except MSE 499 not used to fulfill other requirements.

³ Any upper-division CE, CH E, CHEM, CPT S, E E, MATH, ME, MSE, PHYSICS, or STAT course not used to fulfill other requirements(except Integrated Capstone courses in Engineering).

MECHANICAL ENGINEERING (125 HOURS)

Criteria for Certification – Mechanical Engineering Program

The School of Mechanical and Materials Engineering will establish the total number of students to be certified into the Mechanical Engineering program.

Students should apply for certification in the semester after they have completed the following five courses: MATH 171, MATH 172, CHEM 105, PHYSICS 201, and CE 211. Students must have a minimum cumulative GPA of 2.5 and a C or better grade for each of the five courses listed above to be considered for certification. Transfer students who meet the aforementioned minimum requirements may apply during their first semester at WSU, but no decision will be made until the end of the semester when the final grades become available. Exception to this residence requirement is described in item 3. Note that the actual cutoff grade point based on the ranking (see item 4) is usually higher than 2.5*.

Transfer students who have completed or are about to complete MATH 220, MATH 273, MATH 315, CHEM 106, PHYSICS 202, ME 212, CE 215, and computer programming before starting at WSU, and have at least a 3.2 average GPA for the math, science, and engineering courses completed can be certified at the time of admission.

Students need to submit an application for certification to the Undergraduate Student Services office, Sloan 205 or electronically to newcoug@mme.wsu.edu. The application deadline is the Monday after finals week in December and May for the fall and the spring semester respectively.

The applicants will be ranked based on the GPA of the math, science, and engineering courses completed. For those who are borderline, the semester and cumulative GPA will be considered and used as a reference. In addition to GPA, other factors may also be taken into consideration, such as the number of math, science, and engineering courses taken at WSU. The committee has the authority to weigh these factors in its decision for certification.

The certification is only valid for the current resident campus. Should a student decide to change campus after certification, they will need to reapply for certification for the campus to which they will transfer.

Students who are deficient under the University's Academic Regulations are subject to decertification. The undergraduate studies committee will determine the eligibility and probation conditions for decertified students who will be permitted to apply for recertification.

Any further questions should be addressed to the Undergraduate Student Services Office in Sloan 205 or newcoug@mme.wsu.edu.

*The cutoff GPA fluctuates each semester depending on the number of applicants. Contact the department for details.

First Year

First Term	Hours
CHEM 105 [PSCI]	4
Creative & Professional Arts [ARTS]	3
ENGR 120	2
HISTORY 105 [ROOT]	3
MATH 171 [QUAN]	4

Second Term	Hours
Biological Sciences [BSCI]	3
CHEM 106	4
ENGLISH 101 [WRTG]	3
MATH 172	4
ME 116	2

Second Year

First Term	Hours
CE 211	3
CPT S 121 or E E 221	2 or 4
ECONS 102 [SSCI]	3
MATH 220	2
MATH 273	2
PHYSICS 201	4

Second Term	Hours
CE 215	3
MATH 315	3
ME 212	3
ME 216	2
ME 220	1
PHYSICS 202	4
Complete Writing Portfolio	

Third Year

First Term	Hours
E E 304 or 261	2 or 3
MATH/STAT 370	3
ME 301	3
ME 303	3
ME 313	3
MSE 201	3

Second Term	Hours
ENGLISH 402 [WRTG]	3
ME 304	3
ME 306	2
ME 310	2
ME 311	1
ME 316	3
ME 348	3

Fourth Year

First Term	Hours
Diversity [DIVR]	3
ME 401	3
ME 405	3
ME 415 [M]	3
Technical Elective ¹	3

Second Term	Hours
Humanities [HUM]	3
ME 406 [M]	3
ME 416 [CAPS]	3

Technical Elective¹ 3
Complete Fundamentals of Engineering Exam

¹ Technical Elective: Any 400-500-level ME or MSE course not listed as a major requirement (MSE 440 excluded).

Minors

Materials Science and Engineering

A minor in materials science and engineering requires 16 credits which must include ME 220 and MSE 201. An additional 12 credits must be chosen from MSE 302, 316, 321, 401, 402, 403, 404, 406, 413, ME 310, ME 311, or E E 496. 9 hours of upper-division work must be taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Mechanical Engineering

A minor in mechanical engineering requires 16 credits of 300-400-level ME courses, including two of the following four courses: ME 303, 304, 348, 414. 9 hours of upper-division work must be taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Description of Courses

MECHANICAL ENGINEERING

ME

116 Engineering Computer-aided Design and Visualization 2 (0-6) Course Prerequisite: MATH 171 or concurrent enrollment. Introduction to 3-D solid modeling, parts, drawings, assemblies, multi-body parts, sketch editing, sheet metal, weldments, surface and mold tools.

212 Dynamics 3 Course Prerequisite: MATH 172 or 182 with a grade of C or better; CE 211 with a grade C or better. Kinematics and kinetics of particles and rigid bodies; introduction to mechanical vibration. Cooperative: Open to UI degree-seeking students.

216 Integrated CAD Design 2 (0-6) Course Prerequisite: ME 116 with a C or better; CE 215 or concurrent enrollment. CAD based analysis for engineering design, the application of motion, FEA and CFD, CAD simulations to the engineering design process.

220 Materials Laboratory 1 (0-3) Course Prerequisite: CE 215 or concurrent enrollment. Mechanical behavior of materials and application to engineering structures.

301 Fundamentals of Thermodynamics 3 Course Prerequisite: PHYSICS 201 with a grade of C or better. Thermodynamic properties of matter, ideal and real gases, work and heat, first and second laws and their application to engineering systems. Cooperative: Open to UI degree-seeking students.

- 303 Fluid Mechanics** 3 Course Prerequisite: ME 212. Fluid statics, laminar and turbulent flow, similitude, pipe flow, boundary layers, lift and drag and measurement techniques. Cooperative: Open to UI degree-seeking students.
- 304 Heat Transfer** 3 Course Prerequisite: ME 301; ME 303; certified major in Mechanical Engineering. Conduction, radiation, and convection heat transfer; analytical, numerical, experimental results for solids, liquids, and gases; heat exchanger design. Cooperative: Open to UI degree-seeking students.
- 306 Thermal and Fluids Laboratory 2** (1-3) Course Prerequisite: ME 301; ME 303; STAT 370 or concurrent enrollment; certified major in Mechanical Engineering. Instrumentation, data acquisition, and theory verification in the thermal and fluid sciences.
- 310 Manufacturing Processes** 2 Course Prerequisite: MSE 201; certified major in Mechanical Engineering. Manufacturing processes, material fabrication, and nontraditional processing.
- 311 Manufacturing Processes Laboratory 1** (0-3) Course Prerequisite: ME 310 or concurrent enrollment; certified major in Mechanical Engineering. Manufacturing processes laboratory in machining, welding, forming; manufacturing project.
- 313 Engineering Analysis** 3 (2-3) Course Prerequisite: MATH 315 or concurrent enrollment; CE 215; E E 221, CPT S 121, or CPT S 251. Analysis and modeling of engineering problems utilizing numerical and mathematical techniques and computers. Cooperative: Open to UI degree-seeking students.
- 316 (414) Mechanical Component Analysis and Design** 3 Course Prerequisite: CE 215; ME 216 or concurrent enrollment; ME 220 or concurrent enrollment; certified major in Mechanical Engineering. Optimal design of machinery; analysis for prevention of machine elements failure.
- 348 Dynamics Systems** 3 Course Prerequisite: ME 212; ME 313; certified major in Mechanical Engineering. Fundamentals of vibration analysis, control systems, system modeling and dynamics analysis.
- 401 Mechatronics** 3 (2-3) Course Prerequisite: E E 304; ME 348; certified major in Mechanical Engineering. Integration of mechanical and microprocessor-based systems; control theory implemented with data acquisition systems; sensors; actuators, signal conditioning, programmable logic controllers.
- 405 Thermal Systems Design** 3 Course Prerequisite: ME 304; certified major in Mechanical Engineering. Design and analysis of thermofluid systems using principles of thermodynamics, fluid mechanics and heat transfer.
- 406 [M] Experimental Design** 3 (1-6) Course Prerequisite: ENGLISH 402 or concurrent enrollment; ME 220; ME 304; ME 306; ME 348; certified major in Mechanical Engineering. Designing, conducting, and reporting of experimental investigations involving mechanical equipment.
- 407 Computational Fluid Dynamics** 3 Course Prerequisite: ME 303. Basic concepts and applications of computational fluid dynamics to the analysis and design of fluid systems and components.
- 413 Mechanics of Solids** 3 Course Prerequisite: CE 215; MSE 201. Elasticity, elastic stress distributions; plastic deformation of single and polycrystals; introduction to dislocation theory and its applications; creep, fracture, fatigue. (Crosslisted course offered as MSE 413, ME 413).
- 415 (316) [M] Engineering Design** 3 Course Prerequisite: ME 310 or concurrent enrollment; ME 311 or concurrent enrollment; ME 316 or concurrent enrollment; certified major in Mechanical Engineering. Systems and component design; product development from specifications to manufacturing; team-based CAD design projects; engineering economics; engineering professional skills.
- 416 [CAPS] Mechanical Systems Design** 3 (1-6) Course Prerequisite: ME 304; ME 348; ME 415; certified major in Mechanical Engineering; senior standing. Integrative design in mechanical engineering; multidisciplinary design project considering both technical and non-technical contexts; organizational dynamics and communications.
- 419 Air Conditioning** 3 Course Prerequisite: ME 404. Principles of heat and moisture transfer; air motion and purity in buildings; design of systems. Cooperative: Open to UI degree-seeking students.
- 431 Design of Solar Thermal Systems** 3 Course Prerequisite: ME 301; ME 303; ME 404; certified major in Mechanical Engineering or Materials Science Engineering. Design of solar thermal systems for heating and cooling of buildings, heating of water, electrical generation, industrial processes and distillation.
- 436 Combustion Engines** 3 Course Prerequisite: ME 303. Internal combustion engines; spark ignition engines, diesels, and gas turbines.
- 439 Applied Aerodynamics** 3 Course Prerequisite: ME 303. Aerodynamic lift and drag; circulation; boundary layers, application to subsonic aircraft wing design.
- 449 Mechanical Vibration** 3 Course Prerequisite: ME 348. Vibrating systems and noise producing mechanisms; design for noise and vibration control. Cooperative: Open to UI degree-seeking students.
- 461 Introduction to Nuclear Engineering** 3 Course Prerequisite: MATH 315; certified major in engineering or physical sciences; senior standing. Applied nuclear physics; application to the nuclear fuel cycle and nuclear reactor core design; nuclear reactor systems and safety. (Crosslisted course offered as ME 461, CHE 461).
- 466 Fundamentals of Engineering Examination Review** 1 Course prerequisite: Certified engineering or computer science major. Review of engineering fundamentals and mechanical engineering discipline specific topics to prepare for the Fundamentals of Engineering Examination. S, F grading.
- 472 Finite Element Methods in Design** 3 Course Prerequisite: ME 414. Design of selected mechanical systems components using finite element analysis.
- 473 Advanced CAD and Geometric Modeling** 3 (2-3) Course Prerequisite: ME 316. Parametric and feature based CAD/CAM; geometric modeling and its mathematical basis; integration of CAD with design processes and other software.
- 474 Design for Manufacture and Modern Manufacturing Strategies** 3 Course Prerequisite: ME 310. Design for manufacture and assembly; modern manufacturing philosophies and practices; lean manufacturing; manufacturing cost and time analysis; quality control.
- 475 Manufacturing Enterprise Systems -- Automation and Product Realization** 3 (2-3) Course Prerequisite: ME 310; ME 311. Manufacturing automation and product realization; information technology and electronic data in manufacturing enterprise systems; product life-cycle management (PLM); sustainable and green manufacturing. Field trip to manufacturing industries required.
- 481 Control Systems** 3 Course Prerequisite: ME 348. Analysis and design of feedback control systems. Cooperative: Open to UI degree-seeking students.
- 483 Topics in Mechanical Engineering** V 1 (0-4) to 4 (0-16) May be repeated for credit; cumulative maximum 7 hours. Contemporary topics in materials engineering.
- 488 Professional Practice Coop/Internship I** V 1-2 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: By department permission. Practicum for students admitted to the VCEA Professional Practice and Experiential Learning Program; integration of coursework with on-the-job professional experience. (Crosslisted course offered as ENGR 488, BIO ENG 488, CHE 488, CE 488, CPT S 488, E E 488, ME 488, MSE 488, SDC 488). S, F grading.
- 495 Internship in Mechanical Industry** V 3-6 May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: Certified major in Mechanical Engineering. By interview only. Students work full time on engineering assignment in approved industries with industrial and faculty supervision. S, F grading.
- 499 Special Problems** V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 501 Continuum Mechanics** 3 Unified presentation of principles common to all branches of solid and fluid mechanics; viscous fluids, elasticity, viscoelasticity, and plasticity. Cooperative: Open to UI degree-seeking students.

- 502 Sustainability Assessment for Engineering Design** 3 Sustainability assessment, including environmental, societal, and economic assessment, in design and planning for entire product life cycle. Cooperative: Open to UI degree-seeking students.
- 503 Systems Design Approaches for Sustainability** 3 Sustainability in systems design methodologies; systems modeling and decision-making for sustainability; multidisciplinary design optimization; research topics. Cooperative: Open to UI degree-seeking students.
- 509 MEMS Engineering** 3 (2-3) Introduction to the design, fabrication and application of microelectromechanical systems. (Crosslisted course offered as ME 509, MSE 509). Cooperative: Open to UI degree-seeking students.
- 513 Crystal Plasticity** 3 Dislocation theory; slip; climb; mechanical properties of polycrystalline materials and application to important deformation processes. (Crosslisted course offered as MSE 513, ME 513, MATSE 513). Cooperative: Open to UI degree-seeking students.
- 514 Thermodynamics of Solids** 3 Thermodynamic properties of solid solutions; models for substitutional and interstitial solutions; configurational and non-configurational contributions; calculation of phase diagrams. (Crosslisted course offered as MSE 514, ME 514). Cooperative: Open to UI degree-seeking students.
- 515 Advanced Heat Transfer** 3 Derivation of the energy conservation equation; laminar and turbulent forced convection heat transfer with internal and external flow; free convection. Cooperative: Open to UI degree-seeking students.
- 516 Conduction and Radiation Heat Transfer** 3 Principles of conduction and radiation heat transfer with focus on solving conduction and radiation problems of engineering interest. Cooperative: Open to UI degree-seeking students.
- 517 Thin Films** 3 Materials science aspect of thin films, including growth, characterization, and properties for electrical, mechanical, corrosion, and optical behavior. (Crosslisted course offered as MSE 517, ME 517). Cooperative: Open to UI degree-seeking students.
- 520 Multiscale Modeling in Thermomechanics of Materials** 3 Multiscale problems in thermomechanics of materials; practical and computational aspects of homogenization, granular materials, dislocation plasticity and atomistic methods. (Crosslisted course offered as ME 520, MSE 520). Cooperative: Open to UI degree-seeking students.
- 521 Fundamentals of Fluids I** 3 Governing equations of fluid mechanics accompanied by applications of Navier-Stokes equation to simple flow situations, boundary layer analysis. Cooperative: Open to UI degree-seeking students.
- 525 Biomechanics** 3 Methods for analysis of rigid body and deformable mechanics; application to biological tissue, especially bone, cartilage, ligaments, tendon and muscle. (Crosslisted course offered as BIO ENG 425/525, ME 525). Credit not granted for more than one of BIO ENG 425, BIO ENG 525, or ME 525.
- 526 Statistical Thermodynamics** 3 Microscopic development of equilibrium; classical and quantum particle statistics; statistical description of real and ideal gases, solids, and liquids. Cooperative: Open to UI degree-seeking students.
- 527 Macroscopic Thermodynamics** 3 Advanced thermodynamics from macroscopic viewpoint; basic postulates, equilibrium, stability, property relations; application to thermal-fluid and solid mechanics; irreversible thermodynamics. Cooperative: Open to UI degree-seeking students.
- 530 Elasticity** 3 Theory of kinematics of solid deformable bodies; conservation laws applied to an elastic continuum; generalized linear stress-strain behavior with applications. (Crosslisted course offered as ME 530, MSE 530). Cooperative: Open to UI degree-seeking students.
- 531 Theory of Plasticity** 3 The fundamentals of the theory of plasticity; the classical theory of plasticity; the classical theory and modern continuum theories of large elasto-plastic deformations. (Crosslisted course offered as ME 531, MSE 531). Cooperative: Open to UI degree-seeking students.
- 532 Finite Elements** 3 Theory of finite elements; applications to general engineering systems considered as assemblages of discrete elements. (Crosslisted course offered as CE 532, ME 532). Cooperative: Open to UI degree-seeking students.
- 534 Mechanics of Composite Materials** 3 Analysis of micromechanical and macromechanical behavior of composite materials with emphasis on fiber-reinforced composite; prediction of properties; stiffness and strength theories; laminated beams and plates; dynamic behavior; environmental effects. (Crosslisted course offered as ME 534, MSE 534). Cooperative: Open to UI degree-seeking students.
- 537 Fracture Mechanics and Mechanisms** 3 Fracture mechanics and mechanisms and the microstructural origins of toughness in metals, polymers and composites. (Crosslisted course offered as MSE 537, ME 537). Cooperative: Open to UI degree-seeking students.
- 540 Advanced Dynamics of Physical Systems** 3 Newtonian dynamics, rotating coordinate systems; Lagrangian and Hamiltonian mechanics; gyroscopic mechanics, other applications. Cooperative: Open to UI degree-seeking students.
- 556 Numerical Modeling in Fluid Mechanics** 3 Fundamental concepts in development of numerical models for fluid flow with applications to steady and unsteady flows. Cooperative: Open to UI degree-seeking students.
- 565 Nuclear Reactor Engineering** 3 Reactor power distribution; thermal and exposure limits; critical heat flux and pressure design; neutronic/thermal hydraulic relationships; transient/accident analysis. Cooperative: Open to UI degree-seeking students.
- 574 Foundations of CAD** 3 Topics fundamental to the creation of CAD, engineering visualization, and virtual reality based engineering software. Cooperative: Open to UI degree-seeking students.
- 575 Geometric Modeling** 3 Study of the mathematics behind the creation of complex shapes for CAD using curves, surfaces, and solids. Cooperative: Open to UI degree-seeking students.
- 579 Advanced Topics in Mechanical Engineering** V 1-3 May be repeated for credit. Cooperative: Open to UI degree-seeking students.
- 581 Control Systems** 3 Analysis and design of feedback control systems. Cooperative: Open to UI degree-seeking students.
- 598 Seminar** 1 May be repeated for credit. Current research interests. Cooperative: Open to UI degree-seeking students. S, F grading.
- 600 Special Projects or Independent Study** V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination** V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 702 Master's Special Problems, Directed Study, and/or Examination** V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.
- 800 Doctoral Research, Dissertation, and/or Examination** V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Mechanical Engineering or Engineering Science PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

MATERIALS SCIENCE AND ENGINEERING**MSE**

- 110 Introduction to Materials Science 2** Introduction to the science and technology of metals, polymers, ceramics and composites.
- 201 Materials Science 3** Course Prerequisite: CHEM 105; PHYSICS 201 or concurrent enrollment. Structure of materials, phase equilibrium, phase transformations, and mechanical properties.
- 302 Electronic Materials 3** Course Prerequisite: CHEM 105; PHYSICS 202 or concurrent enrollment. Structure of materials, electronic structure of solids; thermal, electrical, dielectric, and magnetic properties of materials; semiconductors processing.
- 316 Thermodynamics and Kinetics of Materials 3** Course Prerequisite: MSE 201. Laws of thermodynamics, solution thermodynamics, free energy composition diagrams, mechanisms and kinetics of diffusion; solidification behavior, interfaces and phase boundaries, phase transformations in solids, oxidation, and corrosion.
- 320 [M] Materials Structure - Properties Lab 3** (1-6) Course Prerequisite: MSE 201 or concurrent enrollment. Principles and techniques of optical metallography and other laboratory methods used in modern materials science and engineering.
- 321 Materials Characterization 3** Course Prerequisite: MSE 201. Properties of x-rays, scattering and diffraction; crystal structures; x-ray diffraction methods, transmission electron microscopy and scanning electron microscopy.
- 323 Materials Characterization Lab 2** (1-3) Course Prerequisite: MSE 321 or concurrent enrollment. Laboratory exercises on materials characterization: x-ray, TEM, SEM.
- 401 Metallic Materials 3** Course Prerequisite: MSE 201. Major alloy systems and manufacturing processes; materials selection.
- 402 Polymeric Materials 3** Course Prerequisite: MSE 201. Structural characterization, syntheses, and reactions of polymeric materials; relationships between structure and properties, viscoelasticity, deformation, and physical behavior of polymers. Cooperative: Open to UI degree-seeking students.
- 403 Ceramic Materials 3** Course Prerequisite: MSE 201. Processing, characteristics, microstructure, and properties of ceramic materials.
- 404 Engineering Composites 3** Course Prerequisite: MSE 201. Basic concept in design and specifications of engineering composites.
- 406 Biomaterials 3** Course Prerequisite: MSE 201. Overview of the different types of materials used in biomedical applications such as implants and medical devices. Credit not granted for both MSE 406 and MSE 506. (Crosslisted course offered as MSE 506 and MATSE 506.)

- 413 Mechanics of Solids 3** Course Prerequisite: CE 215; MSE 201. Elasticity, elastic stress distributions; plastic deformation of single and polycrystals; introduction to dislocation theory and its applications; creep, fracture, fatigue. (Crosslisted course offered as MSE 413, ME 413).
- 425 [M] Senior Thesis I 3** (0-9) Course Prerequisite: MSE 320; MSE 323, senior standing; certified major in Materials Science Engineering. Research in materials science and engineering.
- 426 [M] Senior Thesis II 3** (0-9) Course Prerequisite: MSE 320; MSE 323, senior standing; certified major in Materials Science Engineering. Research in materials science and engineering.
- 483 Topics in Materials Engineering V 1** (0-4) to 4 (0-16) May be repeated for credit; cumulative maximum 7 hours. Contemporary topics in materials engineering.
- 488 Professional Practice Coop/Internship I V 1-2** May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: By department permission. Practicum for students admitted to the VCEA Professional Practice and Experiential Learning Program; integration of coursework with on-the-job professional experience. (Crosslisted course offered as ENGR 488, BIO ENG 488, CHE 488, CE 488, CPT S 488, E E 488, ME 488, MSE 488, SDC 488). S, F grading.
- 499 Special Problems V 1-4** May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 503 Advanced Topics in Materials Engineering V 1-3** May be repeated for credit; cumulative maximum 6 hours. Cooperative: Open to UI degree-seeking students.
- 505 Advanced Materials Science 3** Broad baseline in materials science including relationships between structure and properties. (Crosslisted course offered as MSE 505, MATSE 505). Cooperative: Open to UI degree-seeking students.
- 506 Biomaterials 3** Overview of the different types of materials used in biomedical applications such as implants and medical devices. Credit not granted for both MSE 406 and MSE 506. (Crosslisted course offered as MSE 506 and MATSE 506.)
- 508 Polymer Nanocomposites and Functionalities 3** Structures, properties, fabrication and applications of nano-scale material and their polymer nanocomposites; functionalities including flame retardant, electrically, thermal and damping properties. Cooperative: Open to UI degree-seeking students.

- 509 MEMS Engineering 3** (2-3) Introduction to the design, fabrication and application of microelectromechanical systems. (Crosslisted course offered as ME 509, MSE 509). Cooperative: Open to UI degree-seeking students.
- 513 Crystal Plasticity 3** Dislocation theory; slip; climb; mechanical properties of polycrystalline materials and application to important deformation processes. (Crosslisted course offered as MSE 513, ME 513, MATSE 513). Cooperative: Open to UI degree-seeking students.
- 514 Thermodynamics of Solids 3** Thermodynamic properties of solid solutions; models for substitutional and interstitial solutions; configurational and non-configurational contributions; calculation of phase diagrams. (Crosslisted course offered as MSE 514, ME 514). Cooperative: Open to UI degree-seeking students.
- 515 Electronic Properties of Materials 3** Electron energy bands in solids, electrical conduction in metals and semiconductors, applications to semi-conduction devices based on silicon and III-V compounds. Cooperative: Open to UI degree-seeking students.
- 516 Phase Transformations 3** Thermodynamics, nucleation, interface motion, mechanisms and kinetics of chemical reactions between solid metals and their environment. (Crosslisted course offered as MSE 516, MATSE 516). Cooperative: Open to UI degree-seeking students.
- 517 Thin Films 3** Materials science aspect of thin films, including growth, characterization, and properties for electrical, mechanical, corrosion, and optical behavior. (Crosslisted course offered as MSE 517, ME 517). Cooperative: Open to UI degree-seeking students.
- 520 Multiscale Modeling in Thermomechanics of Materials 3** Multiscale problems in thermomechanics of materials; practical and computational aspects of homogenization, granular materials, dislocation plasticity and atomistic methods. (Crosslisted course offered as ME 520, MSE 520). Cooperative: Open to UI degree-seeking students.
- 521 Statistics of Microstructures 3** Stereology, orientation and spatial distributions, percolation, measurement techniques and application to modeling of microstructures. (Crosslisted course offered as MSE 521, MATSE 521). Recommended preparation: MATH 540. Cooperative: Open to UI degree-seeking students.
- 523 Ceramics Processing 3** Fundamentals of ceramic processing science for thin films and bulk ceramics. Cooperative: Open to UI degree-seeking students.
- 530 Elasticity 3** Theory of kinematics of solid deformable bodies; conservation laws applied to an elastic continuum; generalized linear stress-strain behavior with applications. (Crosslisted course offered as ME 530, MSE 530). Cooperative: Open to UI degree-seeking students.

531 Theory of Plasticity 3 The fundamentals of the theory of plasticity; the classical theory of plasticity; the classical theory and modern continuum theories of large elasto-plastic deformations. (Crosslisted course offered as ME 531, MSE 531). Cooperative: Open to UI degree-seeking students.

534 Mechanics of Composite Materials 3 Analysis of micromechanical and macromechanical behavior of composite materials with emphasis on fiber-reinforced composite; prediction of properties; stiffness and strength theories; laminated beams and plates; dynamic behavior; environmental effects. (Crosslisted course offered as ME 534, MSE 534). Cooperative: Open to UI degree-seeking students.

537 Fracture Mechanics and Mechanisms 3 Fracture mechanics and mechanisms and the microstructural origins of toughness in metals, polymers and composites. (Crosslisted course offered as MSE 537, ME 537). Cooperative: Open to UI degree-seeking students.

543 Polymer Materials and Engineering 3 Preparation and structure-property relationship of polymer materials with emphasis on fracture mechanics and toughening. (Crosslisted course offered as MSE 543, CE 593). Required preparation must include MSE 402. Cooperative: Open to UI degree-seeking students.

544 Natural Fibers 3 Structural aspects and properties of natural fibers including anatomy, ultrastructure, and chemistry. (Crosslisted course offered as CE 594, MSE 544). Cooperative: Open to UI degree-seeking students.

545 Polymer and Composite Processing 3 Polymer and composite processing from fundamental principles to practical applications. (Crosslisted course offered as MSE 545, CE 595). Cooperative: Open to UI degree-seeking students.

546 Engineered Wood Composites 3 Theory and practice of wood composite materials, manufacture and development. (Crosslisted course offered as CE 596, MSE 546). Cooperative: Open to UI degree-seeking students.

547 Polymers and Surfaces for Adhesion 3 Physical chemistry of polymers and surfaces needed to understand interface morphology, adhesion mechanisms and bond performance. (Crosslisted course offered as CE 597, MSE 547). Required preparation must include MSE 402 or 404. Cooperative: Open to UI degree-seeking students.

548 Natural Fiber Polymer Composites 3 Fundamentals, development and application of composite materials produced from polymers reinforced with natural fibers and wood as major components. (Crosslisted course offered as CE 598, MSE 548). Cooperative: Open to UI degree-seeking students.

592 Transmission Electron Microscopy 3 Development of the principles and applications of electron optics in microscopy. Cooperative: Open to UI degree-seeking students.

600 Special Projects or Independent Study V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.

700 Master's Research, Thesis, and/or Examination V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

702 Master's Special Problems, Directed Study, and/or Examination V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

Department of Military Science

rotc.wsu.edu
Avery 405
509-335-2591

Professor and Department Chair, Lieutenant Colonel C. Heartherly.

The Department of Military Science is the formal designation of the Army ROTC program at Washington State University. It is designed to educate, train, and motivate qualified students to serve as commissioned officers in the U.S. Army upon graduation. The military science department offers academic, professional, and technical education and training that complements the educational programs and goals at WSU.

The military science curriculum comprises a two-year basic course (freshman and sophomore years) and a two-year advanced course (junior and senior years). The basic course is open to all WSU students. Enrollment in the advanced course is offered only with the approval of the department chair.

At WSU, military science courses emphasize training in a practical environment. Students learn leadership skills through classroom instruction, on-campus leadership labs, and summer training opportunities. The goal of this training is to develop leadership goals applicable in both military and civilian occupations. During the summer, usually between the junior and senior year of academic study, enrolled cadets must attend Cadet Leader Course at Knox, KY. This is a 30 day leadership practicum administered by Officers and NCOs of the U.S. Army that develops and assesses the leadership capabilities of the cadets..

Competitive, merit-based scholarships are available to deserving individuals. These scholarships pay

either Tuition and associated fees, or Room and Board. Scholarship winners also receive \$1200/year for books (\$600 each semester). Basic course cadets on an ROTC scholarship and advance course cadets receive a monthly tiered stipend ranging from \$300/month for freshmen to \$500/month for seniors. High school students may apply for a four-year Army ROTC scholarship in the fall of their senior year (high school) if they are interested in pursuing a military career. Students at WSU may apply for campus-based scholarships if they have a similar interest. Scholarships are also available for those students interested in pursuing commissioned service in the National Guard or Army Reserve, without a full-time commitment to active duty upon graduation.

Upon successful completion of the advanced course and graduation from WSU, cadets are commissioned as U.S. Army officers and serve in either the Active Duty Army, the Army Reserves, or the National Guard.

Minors

Military Science

A Military Science minor requires 18 hours of approved Military Science courses, with at least 9 hours of 300-400-level credits taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. Students must take the following courses to complete this minor: MIL SCI 101, 102, 201, 202, 301, 302, 401, and 402.

Description of Courses

MILITARY SCIENCE

MIL SCI

101 The United States Army 1 Role of the Army in contemporary society.

102 National and International Role of the Army 1 Role of the Army in today's international affairs.

110 Cougar Rangers I 1 Military adventure training, pioneering activities, military skills and small unit tactics. Field trip required.

111 Cougar Rangers II 1 Military adventure training, pioneering activities, military skills and small unit tactics. Field trip required.

201 Introduction to Leadership 2 Multidisciplinary approach to military leadership.

202 The Officer as a Professional 2 U.S. Army Officer Corps as a profession; the U.S. Army Officer as a professional.

301 Applied Leadership and Management 3 Course Prerequisite: By instructor permission. Troop leadership procedures emphasizing instruction in military professionalism and ethics; practical aspects of tactics and leadership practicum.

302 Small Unit Tactics and Military Leadership 3 Course Prerequisite: By instructor permission. Preparation, delivery, and critique of practical oral presentations; leadership of small units; offensive and defensive operations.

320 Leadership Development Assessment 6 (0-18) Course Prerequisite: MIL SCI 301; MIL SCI 302. By interview only. Intensive study and internship in military tactics, command and leadership; held at Fort Lewis, WA. S, F grading.

396 Leader Internship 6 Course Prerequisite: Junior standing. By interview only. Fully funded non-committal leader internship and Army orientation; provides leader training and assessment. May be taken as MGTOP 498, POL S 497, PE ACTIV 201, or ED AD 499 with permission. S, F grading.

401 Advanced Military Leadership 3 Course Prerequisite: By instructor permission. Historical and legal basis of military justice; small unit management; military professionalism and ethics.

402 Advanced Military Management and Practicum 3 Course Prerequisite: By instructor permission. Theory and practice of Army administration/management; staff planning and correspondence; pre-commission orientation; unit management/resources application.

499 Special Problems V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.

School of Molecular Biosciences

smb.wsu.edu
Biotechnology-Life Sciences 102
509-335-1276

Director and Professor, J. Jones; Senior Associate Director and Professor, M. Konkel; Associate Director for Graduate Program and Professor, K. Kim; Associate Director for Undergraduate Programs and Associate Professor, W. Davis; Associate Director for Alumni Relations and Clinical Associate Professor, M. Sanchez-Lanier; Director of PSM program, Associate Director of Online courses and Clinical Associate Professor, N. McCabe; Assistant Director for Undergraduate Laboratories and Clinical Associate Professor, C. Helmick; Regents Professors, M. Griswold, M. Smerdon; Professors, J. Alderete, M. Black, R. Brosemer, T. Hassold, P. Hunt, M. Hunzicker-Dunn, L. Xun; Associate Professors, R. Carabeo, C. Cooper (Vancouver), L. Gloss, C. Haseltine, C. Her, J. Oatley, E. Offerdahl, E. Shelden, S. Sylvester (Vancouver), S. Wang, J. Watts, J. Wyrick; Assistant Professors, A. Goodman, S. Roberts, W. Winuthayanon; Faculty with Associate Status, H. Aguilar-Carreno, T. Bankhead, K. Brayton, W. Brown, J. Browse, D. Call, J. Celli, W. Chai (Spokane), M. Chandra, O. Cornejo, J. Harding, M. Hardy, M. Kahn, C. H. Kang, I. Karatsoreos, J. Kelley, L. Knodler, M. Lange, A. Nicola, A. Omsland, J. Pru, K. Roberts (Spokane), B. Rodgers, B. Tanner, L. Thomashow, G. Trobridge, V. Vadyvaloo, B. Walker, G. Wayman, J. Xu; Clinical Associate Professor, P. Mixter; Clinical Assistant Professors, M. Rolfmeier, R. Vithayathil.

Molecular biosciences can be viewed as a dynamic continuum in which approaches derived from biology, chemistry, and physics are utilized to address the fundamental mechanisms of living things. The School of Molecular Biosciences (SMB) offers undergraduate majors in biochemistry, genetics and cell biology, and microbiology. The School of Molecular Biosciences also offers undergraduate minors in biochemistry, genetics and cell biology, microbiology, molecular biology, and pre-genetic counseling. Requirements for these majors and minors are detailed below.

At the graduate level, the school offers programs leading to the degrees of Master of Science and Doctor of Philosophy in Molecular Biosciences. The School also offers a Professional Science Master's degree in Molecular Biosciences that can be earned either on the Pullman Campus or through WSU Global Campus. In addition the school offers a combined undergraduate degree in Genetics and Cell Biology and PSM in Molecular Biosciences.

At the undergraduate level, we expect that our graduating students will possess: 1) an understanding of the major concepts in the molecular biosciences and an awareness of how these concepts are integrated from the molecular to the organismal level; 2) the necessary critical thinking and quantitative reasoning skills, and the ability to apply those skills, to identify and solve biological problems at the cellular, molecular, and structural levels; 3) the oral and written communication skills necessary to effectively communicate key scientific findings in the molecular biosciences to both non-scientific and professional audiences; 4) the scientific literacy necessary to become an informed citizen of a diverse, ever changing, global society, and to engage in a lifetime of scientific learning; and 5) the relevant ethics education and exposure necessary to encourage the highest levels of professionalism and humanism.

STUDENTS PURSUING PRE-MEDICINE, PRE-DENTAL, PRE-PHARMACY, OR PRE-VETERINARY MEDICINE

The majors in the School of Molecular Biosciences provide a perfect home for the student who is interested in pursuing professional education after graduating from WSU. Our degrees have been designed to prepare students to succeed in these professional programs, as well as on the latest versions of the standardized examinations for admission to professional programs. Pre-professional students majoring in SMB are advised by a faculty member in the School and additionally work with a professional specialist from the Health Professions Student Center.

Students from all three SMB undergraduate majors have been successfully admitted to professional programs in medicine and dentistry. The Biochemistry degree is a perfect match for Pre-pharmacy students and highly motivated students should consider our 7-year Fast track B.S. Biochemistry-Pharm.D. program offered in cooperation with the WSU School of Pharmacy. Pre-veterinary medicine students can elect to pursue any SMB major; for students interested in Veterinary Medicine the School offers a 7-year Fast track B.S. Microbiology to DVM program. Students interested in either of these fast track programs should contact the School for more information.

BIOCHEMISTRY

Biochemistry is an interdisciplinary science that involves the application of methods and theories of chemistry to the study of biological phenomena. An undergraduate major in biochemistry prepares you for a variety of careers in industry, education, public service, the health professions, and research in biochemistry, biophysics, molecular biology, and many related fields. Students have training opportunities in a wide range of research areas including protein biochemistry, membrane structure and function, molecular biology of gene regulation, enzymatic reaction mechanisms, signal transduction, DNA repair, reproductive biology, DNA-protein interactions, plant and natural product biochemistry, and structural biology including NMR spectroscopy and x-ray crystallography.

The program offers two curricular options leading to the Bachelor of Science in Biochemistry. The biochemistry/biophysics option provides increased emphasis on chemistry, physics, mathematics, and physical biochemistry, and yields a minor in chemistry. The biochemistry/molecular biology option provides increased emphasis on molecular and cell biology.

GENETICS AND CELL BIOLOGY

Genetics and cell biology are interdisciplinary sciences that are fundamental to all fields of modern biology. Undergraduates who major in genetics and cell biology will be well versed in aspects of the rapidly emerging fields of genomics, epigenetics and bioinformatics. The program affords students the opportunity to study with scientists whose diverse research programs are focused on both the genetics and cell biology of both prokaryotes and eukaryotes. Graduates of the degree will be prepared to work as researchers, in both private- and public-sector science laboratories. This degree also prepares students for entry into graduate school programs leading to Master's and PhD degrees in a variety of disciplines including the broad areas of molecular biology, molecular genetics and cell biology. Students will also be well prepared to enter the professions of medicine, dentistry, veterinary medicine, and genetic counseling.

MICROBIOLOGY

Microbiology is both a basic and an applied science that studies microorganisms and their activities. It is concerned with their form, structure, reproduction, physiology, and identification. It includes the study of their distribution in nature, their relationship to each other and to other living things, their beneficial and detrimental effects on human beings, and the physical and chemical changes they make in their environment. Employment opportunities in industrial, government, hospital, and private laboratories and agencies are excellent for qualified graduates. Areas in which the unit is prepared to direct research include bioremediation, molecular genetics, molecular basis of cell-cell interactions and pathogen virulence, microbial differentiation, cellular immunology and the regulation of the immune response.

The Microbiology degree program offers options in either molecular biology or medical technology, leading to the Bachelor of Science degree in Microbiology. An additional year in an accredited school of clinical laboratory sciences is required after graduation for those interested in becoming certified clinical laboratory scientists.

CERTIFICATION REQUIREMENTS:

A student must meet the following three requirements to be eligible to certify as a SMB major in biochemistry, genetics and cell biology, or microbiology:

- Complete BIOLOGY 106, BIOLOGY107, CHEM 105 and CHEM 106, or transfer equivalents, with a minimum grade of C.
- Earn a minimum cumulative GPA of at least 2.50.
- Earn a minimum of 24 semester hours.

Students must maintain a minimum cumulative GPA of 2.50 for all WSU courses to remain certified in a SMB degree program. A certified major who falls below the minimum requirements will be decertified according to Academic Regulation 56.

GRADUATION REQUIREMENTS:

A grade of C or better is required in all MBIOS courses taken to meet graduation requirements. None of these courses may be taken pass/fail.

STUDENT LEARNING OUTCOMES

for the Biochemistry, Genetics and Cell Biology, and Microbiology Degree Programs:

Before Graduating with a degree from SMB, a student will achieve these learning outcomes:

Global

1. Be competitive for professional and graduate studies and/or employment.

Knowledge

2. Identify the modern foundational knowledge underlying Biochemistry, Cell Biology, Genetics, and Microbiology.

3. Recognize relevant ethical concepts related to scientific publication and research conduct.

Skills

4. Perform basic laboratory techniques used in molecular bioscience research (e.g. light microscopy, gel electrophoresis, PCR, and protein analysis).

5. Design, perform, and quantitatively/qualitatively evaluate the results of laboratory experiments.

6. Locate, retrieve, and evaluate scientific information, especially primary literature, with regards to its adequacy, value, and logic.

7. Prepare oral and written reports in standard scientific formats.

Attitudes

8. Decide that studying the molecular biosciences is rewarding and relevant to everyday life experiences.

9. Appreciate the importance of the ethical implications of scientific issues in society.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

BIOCHEMISTRY - BIOPHYSICS OPTION (120 HOURS)

A grade of C or better is required in all MBIOS

courses taken to meet graduation requirements. None of these courses may be taken pass/fail.

First Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI] or 107 [BSCI]	4
CHEM 105 [PSCI]	4
ENGLISH 101 [WRTG]	3
MATH 106 (accelerated) or Elective ¹	3
MATH 108 (accelerated) or Elective ¹	2

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 106 or 107	4
CHEM 106	4
HISTORY 105 [ROOT]	3
MATH 171 [QUAN]	4

Second Year

<i>First Term</i>	<i>Hours</i>
CHEM 345	4
Communication [COMM] or Written Communication [WRTG]	3
MATH 172	4
MBIOS 301	4

<i>Second Term</i>	<i>Hours</i>
CHEM 348	4
MBIOS 303	4
PHYSICS 201	4
Social Sciences [SSCI]	3
Complete Writing Portfolio	3

Third Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
Humanities [HUM]	3
PHYSICS 202	4
MBIOS 305	3

<i>Second Term</i>	<i>Hours</i>
CHEM 347	3
Diversity [DIVR]	3
MBIOS 304	3
MBIOS 401	3
MBIOS 465	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
CHEM 220	2
CHEM 222	2
MBIOS 413	3
MBIOS 466 or PHYSICS 466	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
Lab Elective ²	3
MBIOS 414	3
MBIOS 454 [M]	3
MBIOS 494 [M] [CAPS]	3
Electives	6
Exit Survey	

¹ If required - consult advisor.

² Lab Elective: minimum of 3 credits selected from MBIOS 402, 411, 430, 498, 499; BIOLOGY 251, 315, 353.

BIOCHEMISTRY - MOLECULAR BIOLOGY OPTION (120 HOURS)

A grade of C or better is required in all MBIOS courses taken to meet graduation requirements. None of these courses may be taken pass/fail.

First Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI] or 107 [BSCI]	4
CHEM 105 [PSCI]	4
ENGLISH 101 [WRTG] or Elective	3
MATH 106 (accelerated) or Elective ¹	3
MATH 108 (accelerated) or Elective ¹	2

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 106 or 107	4
CHEM 106	4
HISTORY 105 [ROOT]	3
MATH 140 [QUAN] or 171 [QUAN]	4

Second Year

<i>First Term</i>	<i>Hours</i>
CHEM 345	4
Communication [COMM] or Written Communication [WRTG]	3
MBIOS 301	4
PHYSICS 101 or 201	4

<i>Second Term</i>	<i>Hours</i>
CHEM 348	4
MBIOS 303	4
PHYSICS 102 or 202	4
Social Sciences [SSCI]	3
Complete Writing Portfolio	3

Third Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
Humanities [HUM]	3
MBIOS 305	3
STAT 212 or 412	3 or 4
Electives	3

<i>Second Term</i>	<i>Hours</i>
Diversity [DIVR]	3
MBIOS 304	3
MBIOS 401	3
MBIOS 465	3
Electives	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
Lab Elective ²	3 or 4
MBIOS 404	3
MBIOS 413	3
Electives	5

<i>Second Term</i>	<i>Hours</i>
MBIOS 414	3
MBIOS 454 [M]	3
MBIOS 494 [M] [CAPS]	3
Lecture Elective ³	3
Electives	3
Exit Survey	

¹ If required - consult advisor.

² Lab Elective: minimum of 3 credits from MBIOS 402, 411, 430, 498, 499; BIOLOGY 251, 315, 353.

³ Lecture elective: select one from MBIOS 410, 423, 426, 440, 442, 450, 466, 478; PHYSICS 466.

GENETICS AND CELL BIOLOGY – MOLECULAR BIOLOGY OPTION (120 HOURS)

A grade of C or better is required in all MBIOS courses taken to meet graduation requirements. None of these courses may be taken pass/fail.

First Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI] or 107 [BSCI]	4
CHEM 105 [PSCI]	4
ENGLISH 101 [WRTG]	3
MATH 106 (accelerated) or Elective ¹	3
MATH 108 (accelerated) or Elective ¹	2

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 106 or 107	4
CHEM 106	4
HISTORY 105 [ROOT]	3
MATH 140 [QUAN] or 171 [QUAN]	4

Second Year

<i>First Term</i>	<i>Hours</i>
CHEM 345 ²	4
Humanities [HUM]	3
MBIOS 301	4
PHYSICS 101 or 201	4

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
MBIOS 303	4
PHYSICS 102 or 202	4
Social Sciences [SSCI]	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
MBIOS 304	3
MBIOS 305	3
STAT 212 or 412	3 or 4
Electives	3

<i>Second Term</i>	<i>Hours</i>
Diversity [DIVR]	3
Lecture Elective ³	3
MBIOS 401	3
Electives	4

Fourth Year

<i>First Term</i>	<i>Hours</i>
Lab Elective ⁴	3 or 4
MBIOS 404	3
MBIOS 423	3
MBIOS 478	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
MBIOS 402 [M]	3
MBIOS 442 or BIOLOGY 476	3
MBIOS 494 [M] [CAPS]	3
Electives	8
Exit Survey	

¹ If required - consult advisor.

² CHEM 345 and 348 recommended for professional or graduate degrees.

³ Lecture elective: select one from BIOLOGY 476, 519; MBIOS 410, 413, 426, 440, 442, 450, 503.

⁴ Lab Elective: minimum of 3 credits selected from MBIOS 411, 430, 454, 498, 499; BIOLOGY 251, 315, 321, 353, 372, 420.

MICROBIOLOGY – MEDICAL TECHNOLOGY OPTION (120 HOURS)

A grade of C or better is required in all MBIOS courses taken to meet graduation requirements. None of these courses may be taken pass/fail.

First Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI] or 107 [BSCI]	4
CHEM 105 [PSCI]	4
ENGLISH 101 [WRTG]	3
MATH 106 (accelerated) or Elective ¹	3
MATH 108 (accelerated) or Elective ¹	2

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 106 or 107	4
CHEM 106	4
HISTORY 105 [ROOT]	3
MATH 140 [QUAN] or 171 [QUAN]	4

Second Year

<i>First Term</i>	<i>Hours</i>
CHEM 345 ²	4
Creative & Professional Arts [ARTS]	3
Humanities [HUM]	3
MBIOS 301	4

<i>Second Term</i>	<i>Hours</i>
MBIOS 303	4
MBIOS 305	3
Social Sciences [SSCI]	3
Electives	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
MBIOS 304	3
PHYSICS 101 or 201	4
STAT 212 or 412	3 or 4
Electives	3

<i>Second Term</i>	<i>Hours</i>
Diversity [DIVR]	3
MBIOS 410	3
MBIOS 450	3
PHYSICS 102 or 202	4
Electives	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 418	4
MBIOS 404	3
MBIOS 430 [M]	3
MBIOS 440	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
MBIOS 411 [M]	3
MBIOS 442	3
MBIOS 494 [M] [CAPS]	3
Electives	5
Exit Survey	

¹ If required - consult advisor.

² CHEM 345 and 348 recommended for professional or graduate degrees.

MICROBIOLOGY – MOLECULAR BIOLOGY OPTION (120 HOURS)

A grade of C or better is required in all MBIOS courses taken to meet graduation requirements. None of these courses may be taken pass/fail.

First Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106 [BSCI] or 107 [BSCI]	4
CHEM 105 [PSCI]	4
ENGLISH 101 [WRTG]	3
MATH 106 (accelerated) or Elective ¹	3
MATH 108 (accelerated) or Elective ¹	2

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 106 or 107	4
CHEM 106	4
HISTORY 105 [ROOT]	3
MATH 140 [QUAN] or 171 [QUAN]	4

Second Year

<i>First Term</i>	<i>Hours</i>
CHEM 345 ²	4
Creative & Professional Arts [ARTS]	3
Humanities [HUM]	3
MBIOS 301	4

<i>Second Term</i>	<i>Hours</i>
MBIOS 303	4
MBIOS 305	3
Social Sciences [SSCI]	3
Electives	4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
MBIOS 304	3
PHYSICS 101 or 201	4
STAT 212 or 412	3 or 4
Electives	2

<i>Second Term</i>	<i>Hours</i>
Diversity [DIVR]	3
MBIOS 410	3
MBIOS 450	3
PHYSICS 102 or 202	4
Electives	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
Lecture Elective ³	3
MBIOS 404	3
MBIOS 430 [M] or 411 [M]	3
MBIOS 440	3
Electives	3

Second Term	Hours
Lab Elective ⁴	3 or 4
MBIOS 442	3
MBIOS 494 [M] [CAPS]	3
Electives	6
Exit Survey	

¹ If required - consult advisor.

² CHEM 345 and 348 recommended for professional or graduate degrees.

³ Lecture elective: select one from MBIOS 342, 401, 413, 426, 446; BIOLOGY 418, ENTOM 343, FS 416.

⁴ Lab Elective: minimum of 3 credits selected from MBIOS 402, 411 or 430, 454, 498, 499; BIOLOGY 251, 315, 353; ENTOM 344; FS 417.

Minors

Biochemistry

A minor in biochemistry requires 17 hours including CHEM 348; MBIOS 303, 304, 413; MBIOS 414, 465, or CHEM 331. A grade of C or better is required in all courses used in the minor. None of these courses may be taken pass/fail. Credit hours for the minor must include 9 hours of upper-division work taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Genetics and Cell Biology

A minor in genetics and cell biology requires 16 hours under the genetics and cell biology degree program at the 300-400-level, including MBIOS 301, 401, and 423. Additional credits may be selected from BIOLOGY 321, MBIOS 402, 404, 426, 478, PHIL 365. 9 hours of upper-division work must be taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. A grade of C or better is required in all course work for the minor.

Microbiology

A minor in microbiology requires a minimum of 16 credit hours including MBIOS 305, 304 or 306, and the remaining selected from: MBIOS 342, 404, 410, 411, 426, 430, 440, 442, 446, 450, 548, FS 416. 9 hours of upper-division work must be taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. A grade of C or better is required in all course work for the minor.

Molecular Biology

A minor in molecular biology requires 20 hours including the following courses: MBIOS 301, 305, 303, 304; MBIOS 401 or 450; MBIOS 404, 413, or 440. A grade of C or better is required in all course work for the minor. Credit hours for the minor must include 9 hours of upper-division work taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. A student whose major is in the School of Molecular Biosciences cannot be granted a minor in molecular biology.

Pre-Genetic Counseling

A minor in pre-genetic counseling requires 19 - 23 hours including MBIOS 301, 423, PHIL 365, PSYCH 321 or 333, 440 or 444, 445, one of MATH 360, PSYCH 311, STAT 212, or 412. A grade of C or better is required in all course work for the minor. Credit hours for the minor must include 9 hours of upper-division work taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Certificates

Molecular Biosciences

The Certificate in Molecular Biosciences requires a minimum of 18 hours. Students are expected to have already completed courses equivalent to one year of freshman chemistry for science majors; one year of freshman biology for science majors; and one semester of organic chemistry; all through an accredited institution of higher education before working towards this certificate. The 15 hour core is: MBIOS 101 or 305 and 306, or 304 and 305; MBIOS 301; MBIOS 303; and MBIOS 320. 3 hours of electives are selected from: ANTH 468, BIOLOGY 140, BIOLOGY 330, CRM J 320, MBIOS 342, PHIL 103, or 365. A grade of C or better must be earned in all classes that apply towards this certificate. Most of the courses required for this certificate have prerequisites. Please consult the catalog to assure that these prerequisites have been met prior to registering for courses.

Description of Courses

MOLECULAR BIOSCIENCES

MBIOS

101 [BSCI] Introductory Microbiology 4 (3-3) Course Prerequisite: Not intended for majors in the School of Molecular Biosciences. Microbiology for the informed citizen as it impacts humans and their environment. Not for students needing BIOLOGY 106 and 107.

138 Molecular Biosciences Seminar 1 Introduction to the field of molecular biosciences: careers, current events, research opportunities at WSU, scientific and research ethics. S, F grading.

201 [COMM] Introduction to Communication in the Molecular Life Sciences 3 (1-4) Course Prerequisite: BIOLOGY 106 with a C or better or BIOLOGY 107 with a C or better. Analysis of primary literature and an introduction to scientific communication skills in the molecular life sciences. (Crosslisted course offered as NEUROSCI 201, MBIOS 201). Recommended preparation: Pre-certified or certified major in Biochemistry, Genetics & Cell Biology, Microbiology, or Neuroscience.

210 Your Future in Life Sciences 2 Exploration of career options in biological sciences with faculty and outside speakers; guide to preparing resume and career plans. (Crosslisted course offered as SCIENCE 210, BIOLOGY 210, MBIOS 210). S, F grading.

301 General Genetics 4 Course Prerequisite: BIOLOGY 106 or 120; BIOLOGY 107; CHEM 101 or 105; CHEM 102 or 106. Principles of modern and classical genetics. (Crosslisted course offered as MBIOS 301, BIOLOGY 301).

303 Introductory Biochemistry 4 Course Prerequisite: CHEM 102 or 345. Modern biochemistry for undergraduates in the biological sciences. Cooperative: Open to UI degree-seeking students.

304 Microbiology and Molecular Biology Laboratory 3 (1-6) Course Prerequisite: MBIOS 303 or concurrent enrollment, or MBIOS 305 or concurrent enrollment. Basic microbiology and molecular biology techniques.

305 General Microbiology 3 Course Prerequisite: BIOLOGY 107; CHEM 102 or 345. Structure, function, nutrition, physiology, and genetics of microbes and their application to immunology, pathology, microbial diversity, and environmental microbiology. Recommended preparation: MBIOS 303.

306 General Microbiology Laboratory 2 (0-6) Course Prerequisite: MBIOS 305 or concurrent enrollment. Laboratory for MBIOS 305.

320 [BSCI] DNA and Society 3 The role of DNA in natural processes and diseases; impact of biotechnology on health care, agriculture, industry, and our lives. Recommended preparation: One college-level course in biology highly recommended.

342 Microbial Ecology 3 Course Prerequisite: BIOLOGY 106 or 120; CHEM 102 or concurrent enrollment, or CHEM 345 or concurrent enrollment. Discussion of microorganism behavior in nature and microbial activities influence on ecological balance.

360 [M] Cell and Molecular Laboratory 2 (0-6) Course Prerequisite: MBIOS 301; MBIOS 303 or concurrent enrollment. Laboratory methods in cell biology, genetics and molecular biology.

401 Cell Biology 3 Course Prerequisite: MBIOS 301; MBIOS 303 or concurrent enrollment. Cellular structure and function; membrane biochemistry and transport; cell-cell communication; regulation of cell cycle and apoptosis; cell signaling; cancer biology. Credit not granted for both MBIOS 401 and MBIOS 501. Recommended preparation for graduate students: Introductory genetics and biochemistry coursework; concurrent enrollment in MBIOS 529 highly recommended.

402 [M] Genetics Laboratory 3 (1-6) Course Prerequisite: MBIOS 301; MBIOS 304. Basic principles of modern and classical genetics utilizing several species.

404 Molecular Biology 3 Course Prerequisite: MBIOS 301; MBIOS 303; MBIOS 305 or concurrent enrollment. Introduction of prokaryotic and eukaryotic genome organization and gene expression, modern molecular techniques, experimental approaches, genome and gene function and analyses.

- 405 Cell Biology of Disease** 3 Course Prerequisite: MBIOS 301; MBIOS 303. Discussion of human diseases characterized by cell biological defects, using popular press and research articles as a source of information. Credit not granted for both MBIOS 405 and 505.
- 410 Medical Microbiology** 3 Course Prerequisite: MBIOS 305; MBIOS 404 or concurrent enrollment. Microbial pathogens and their relationship to disease.
- 411 [M] Diagnostic Medical Bacteriology** 3 (1-6) Course Prerequisite: MBIOS 304; MBIOS 410 or concurrent enrollment. Techniques and tests for the identification of bacteria pathogenic for humans.
- 413 General Biochemistry** 3 Course Prerequisite: MBIOS 303; junior standing. Structure and function of proteins, nucleic acids and biological membranes; principles of enzymology; biochemical methodology. Credit not granted for both MBIOS 413 and MBIOS 513. Recommended preparation: Introductory biochemistry coursework.
- 414 General Biochemistry** 3 Course Prerequisite: MBIOS 413. Metabolism of carbohydrates, proteins, fats, bioenergetics; photosynthesis; control of metabolic processes. Credit not granted for both MBIOS 414 and MBIOS 514.
- 423 Human Genetics** 3 Course Prerequisite: MBIOS 301. Exploration of individual and population genetics leading to critical discussion of current social, medical, and scientific issues.
- 426 Microbial Genetics** 3 Course Prerequisite: MBIOS 301; MBIOS 303. Genetics of bacteria, bacteriophages and plasmids; regulation of gene expression; genetic manipulation of microorganisms.
- 430 [M] Combined Immunology and Virology Laboratory** 3 (1-6) Course Prerequisite: MBIOS 304; MBIOS 305; concurrent enrollment MBIOS 440 or 442. Fundamental principles in immunology including the cultivation and characterization of viruses using laboratory techniques.
- 440 Immunology** 3 Course Prerequisite: MBIOS 305. Principles of basic immunology. Credit not granted for both MBIOS 440 and MBIOS 540. Recommended preparation: Introductory microbiology coursework; concurrent enrollment with MBIOS 548 highly recommended. Cooperative: Open to UI degree-seeking students.
- 442 General Virology** 3 Course Prerequisite: MBIOS 301; MBIOS 303 or concurrent enrollment. The biology of bacterial, animal, and plant viruses. Credit not granted for both MBIOS 442 and MBIOS 542. Recommended preparation: Introductory genetics and biochemistry coursework; concurrent enrollment with MBIOS 548 highly recommended. Cooperative: Open to UI degree-seeking students.
- 446 Epidemiology** 3 Course Prerequisite: Junior standing. Study of diseases in human populations; concepts of etiology, disease rates, susceptibility and risk factors, screening for disease, and prevention. Cooperative: Open to UI degree-seeking students.
- 450 Microbial Physiology** 3 Course Prerequisite: MBIOS 303; MBIOS 304; MBIOS 305. Basic microbial physiology and its relevance to the processes of applied microbiology. Credit not granted for both MBIOS 450 and 550. Recommended preparation: Introductory genetics, biochemistry or microbiology coursework.
- 454 [M] Biochemistry Laboratory** 3 (1-6) Course Prerequisite: MBIOS 303; MBIOS 304. Techniques related to the structural and functional analysis of macromolecules including proteins, lipids and carbohydrates.
- 465 Principles of Biophysical Chemistry** 3 Course Prerequisite: MBIOS 303; MATH 140 or 171; PHYSICS 102 or 202. Biochemical reactions and processes, molecular recognition, coupled reactions, enzyme catalysis, analysis of macromolecular structure by electrophoresis, sedimentation, viscosity, and spectroscopy.
- 478 Bioinformatics** 3 (2-3) Course Prerequisite: MBIOS 301, 303, or CPT S 355. Computer analysis of protein and nucleic acid sequences, functional genomics and proteomics data; modeling biological networks and pathways. Credit not granted for both MBIOS 478 and MBIOS 578. Recommended preparation: Introductory genetics or biochemistry coursework.
- 490 Special Topics in Molecular Biology** V 1-2 May be repeated for credit; cumulative maximum 6 hours. Current topics discussed by experts in the field.
- 494 [CAPS] [M] Senior Project in Molecular Biosciences** 3 Course Prerequisite: Certified major in Biochemistry, Genetics and Cell Biology, or Microbiology; senior standing. Written paper and seminar presentation on laboratory research project.
- 495 Internship Training** V 1-4 May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: By permission only. Experience in work related to specific career interests. S, F grading.
- 498 Directed Research** V 1-4 May be repeated for credit. Course Prerequisite: Minimum 1 credit MBIOS 499. Continued laboratory research; requires oral or poster presentation at a WSU event or external meeting.
- 499 Special Problems** V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 501 Cell Biology** 3 Cellular structure and function; membrane biochemistry and transport; cell-cell communication; regulation of cell cycle and apoptosis; cell signaling; cancer biology. Credit not granted for both MBIOS 401 and MBIOS 501. Recommended preparation for graduate students: Introductory genetics and biochemistry coursework; concurrent enrollment in MBIOS 529 highly recommended.
- 503 Advanced Molecular Biology I** 3 DNA replication and recombination in prokaryotes and eukaryotes; recombinant DNA methods and host/vector systems; genome analysis; transgenic organisms. Recommended preparation: Introductory genetics and biochemistry coursework.
- 504 Advanced Molecular Biology II** 3 Gene expression and regulation in prokaryotes and eukaryotes, including transcription, RNA processing, and translation; chromatin structure; DNA repair. Recommended preparation: Introductory genetics and biochemistry coursework.
- 505 Cell Biology of Disease** 3 Course Prerequisite: MBIOS 301; MBIOS 303. Discussion of human diseases characterized by cell biological defects, using popular press and research articles as a source of information. Credit not granted for both MBIOS 405 and 505.
- 507 Critical Analysis of Scientific Literature** 2 Course Prerequisite: MBIOS 503; MBIOS 513 or concurrent enrollment. Dissection and discussion of current molecular bioscience papers to foster development of critical reading of primary literature.
- 508 Quantitative Approaches in Molecular Biosciences** 2 Quantitative methods and techniques using examples from the current molecular biosciences primary literature. Recommended preparation: One semester of calculus.
- 513 General Biochemistry** 3 Structure and function of proteins, nucleic acids and biological membranes; principles of enzymology; biochemical methodology. Credit not granted for both MBIOS 413 and MBIOS 513. Recommended preparation: Introductory biochemistry coursework.
- 514 General Biochemistry** 3 Course Prerequisite: MBIOS 513. Metabolism of carbohydrates, proteins, fats, bioenergetics; photosynthesis; control of metabolic processes. Credit not granted for both MBIOS 414 and MBIOS 514.
- 525 Advanced Topics in Genetics** V 1-3 May be repeated for credit; cumulative maximum 4 hours. Recent genetics research in selected areas. Recommended preparation: MBIOS 503 or an equivalent course providing a basic understanding of molecular biology or molecular genetics.
- 528 Molecular and Cellular Reproduction** 3 (2-2) State of the art concepts of the molecular, cellular, and physiological aspects of mammalian reproduction. (Crosslisted course offered as MBIOS 528, ANIM SCI 558). Cooperative: Open to UI degree-seeking students.

- 529 Selected Topics in Cell Biology** V 1-3 May be repeated for credit; cumulative maximum 3 hours. Selected topics in cell biology using current literature. Recommended preparation: MBIOS 401 or an equivalent course providing a basic understanding of a typical eukaryotic cell.
- 540 Immunology** 3 Principles of basic immunology. Credit not granted for both MBIOS 440 and MBIOS 540. Recommended preparation: Introductory microbiology coursework; concurrent enrollment with MBIOS 548 highly recommended. Cooperative: Open to UI degree-seeking students.
- 541 Research Seminar** 1 May be repeated for credit; cumulative maximum 2 hours. Literature reviews and research reports. S, F grading.
- 542 General Virology** 3 The biology of bacterial, animal, and plant viruses. Credit not granted for both MBIOS 442 and MBIOS 542. Recommended preparation: Introductory genetics and biochemistry coursework; concurrent enrollment with MBIOS 548 highly recommended. Cooperative: Open to UI degree-seeking students.
- 548 Selected Topics in Immunology & Virology** 1 May be repeated for credit; cumulative maximum 2 hours. Selected topics in immunology and virology using the current literature. Recommended preparation: Concurrent enrollment with MBIOS 540 or 542. Cooperative: Open to UI degree-seeking students.
- 549 Seminar in Immunology** 1 May be repeated for credit; cumulative maximum 2 hours. Seminar series on advances in immunology. May be repeated for credit; cumulative maximum 2 hours. Recommended preparation: MBIOS 540 or concurrent enrollment.
- 550 Microbial Physiology** 3 Basic microbial physiology and its relevance to the processes of applied microbiology. Credit not granted for both MBIOS 450 and 550. Recommended preparation: Introductory genetics, biochemistry or microbiology coursework.
- 561 Biochemical Signaling in Plants, Animals and Microorganisms** 3 Course Prerequisite: MBIOS 513. New research on intra and extra cellular biochemical signaling, including communication in plants and hormone action in animals. (Crosslisted course offered as MBIOS 561, MPS 561).
- 563 Deconstruction of Research** 3 Course Prerequisite: Graduate standing in a WSU biomedical based graduate program. Nature and development of scientific investigation through oral and written avenues, and methods of critical analyses applied to questions of biomedical interest. (Crosslisted course offered as NEUROSCI 563, GLANHLTH 563, MBIOS 563, VET MICR 563, VET PATH 563, VET PH 563).
- 568 Advanced Topics in Molecular Biosciences** V 1-3 May be repeated for credit. Recent research in selected areas of molecular biosciences.
- 574 Protein Biotechnology** 3 Biotechnology related to the isolation, modification and large scale commercial production, patenting and marketing of useful recombinant proteins and products. (Crosslisted course offered as MBIOS 574, CHE 574). Recommended preparation: MBIOS 513.
- 578 Bioinformatics** 3 (2-3) Computer analysis of protein and nucleic acid sequences, functional genomics and proteomics data; modeling biological networks and pathways. Credit not granted for both MBIOS 478 and MBIOS 578. Recommended preparation: Introductory genetics or biochemistry coursework.
- 579 Molecular Biosciences Seminar** 1 May be repeated for credit; cumulative maximum 10 hours. Required of all graduate students in molecular biosciences. S, F grading.
- 580 Science Information Literacy** 2 Efficient methods to locate and effectively use a wide variety of information resources that will be useful in the work world.
- 583 Professional Skills Seminar** 1 Covers many aspects of professionalism, including professional behavior, professional dress, and professional sensitivity in social settings.
- 584 Medical Genetics** 3 The mechanisms of human heredity and how these mechanisms can influence human health.
- 585 Molecular Biotechniques** 2 Background and application of classical and current techniques involved in cloning, characterization, modification, and expression of genes.
- 586 Molecular Biotechniques Laboratory** 1 (0-3) Laboratory exploration of classical and current techniques involved in cloning, characterization, modification, and expression of genes. Recommended preparation: MBIOS 585 or concurrent enrollment.
- 593 Research Proposal** 2 May be repeated for credit; cumulative maximum 4 hours. Written proposal and oral defense of research project in the area of molecular biosciences. S, F grading.
- 600 Special Projects or Independent Study** V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination** V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

702 Master's Special Problems, Directed Study, and/or Examination V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Molecular Biosciences PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Program in Molecular Plant Sciences

mps.wsu.edu
336 French Administration Bldg.
509-335-4527

Chair and Associate Professor, M. M. Neff; Professors, J. A. Browse, G. E. Edwards, J. K. Fellman, K. S. Gill, L. A. Hadwiger, S. H. Hulbert, M. L. Kahn, C. H. Kang, M. Knoblauch, N. R. Knowles, N. G. Lewis, T. W. Okita, H. Pappu, B. W. Poovaiah, E. Roalson, M. Tegeeder, D. von Wettstein; Associate Professors, I. C. Burke, J. W. Busch, A.H. Carter, A. B. Cousins, A. Dhingra, D. R. Gang, H. A. Hellmann, A. Kalyanaraman, H. Kirchhoff, B. M. Lange, A. J. McCubbin, T. Peever, S. Roje, K. Sanguinet, J. J. Wyrick; Assistant Professors, S. P. Ficklin, H.H. Kunz, P. Nabity, M. Pumphrey, A. Smertenko, K. Tanaka, Z. Zhang; Assistant Research Professor, S. Rustgi. Adjunct Professors, K.G. Campbell, P. A. Okubara, C. M. Steber, L. S. Thomashow.

Graduate study leading to the Doctor of Philosophy degree is offered as an interdepartmental curriculum by graduate faculty from the Departments of Crop and Soil Science, Electrical Engineering and Computer Science, Horticulture and Landscape Architecture, Molecular Biosciences, Plant Pathology, Biological Sciences, and the Institute of Biological Chemistry. The objectives of the program are to provide the graduate student with a broad knowledge in molecular plant sciences and with research experience in a chosen area within this discipline. Specialization includes cellular and subcellular physiology, the molecular biology and biochemistry of plant-related processes, photosynthesis and photorespiration, nitrogen fixation, phytochemistry, the physiology of vascular plants, metabolism, plant pathogen interactions, hormonal interactions and regulation of growth, crop production physiology, and physiological ecology as well as related areas in agriculture and biology.

Students entering the program must have completed their baccalaureate degree with training in one year each of elementary biology or botany, and physics, chemistry through one semester of

organic chemistry and biochemistry, one semester each of molecular plant sciences and genetics, and mathematics (through calculus). Limited undergraduate deficiencies may be remedied by taking the appropriate courses upon enrollment in the graduate program on a provisional basis. Degree requirements include courses in molecular biology, advanced molecular plant sciences, plant morphology and anatomy, and metabolism. To meet the minimum requirements of core course credit in the Graduate School, elective courses are chosen as approved by the student's advisor and the supervising committee of graduate faculty. There is no foreign language requirement.

Policies and procedures of the Graduate School apply to all admissions. Interested students may direct their inquiries to molecular plant sciences or to any participating faculty member. Should the latter route be followed, preference for the Program in Molecular Plant Sciences must be indicated and, if possible, the research area of interest identified.

The program offers flexibility for students with varied backgrounds in chemistry, biochemistry, molecular plant sciences, molecular biology, botany, genetics, biology, and the agricultural sciences to pursue advanced training in molecular plant sciences, with independent study and original research in areas of the student's own interests as the single most important component. The interdisciplinary nature of the program assures the student of interaction with molecular plant scientists representing a wide range of research interests and provides the student with a broad choice of specialized facilities which are available in the cooperating academic units.

Students are typically supported by the program during the first academic year. Financial support during subsequent years will be managed by the administering academic unit. Participating faculty may provide support through individual grants and contracts. Every effort will be made to inform applicants of these opportunities.

Course requirements are drawn from existing courses offered by MPS and cooperating departments and programs. In addition, a seminar is held weekly during each semester.

Description of Courses

MOLECULAR PLANT SCIENCES

MPS

515 Seminar in Molecular Plant Sciences 1 May be repeated for credit; cumulative maximum 4 hours. A cross-discipline seminar, including botany, crop and soils sciences, horticulture, plant pathology, and molecular plant sciences. S, F grading.

525 Plant Molecular Genetics 3 Introduction to plant genome organization and gene expression while acquiring knowledge of modern molecular techniques and experimental approaches.

561 Biochemical Signaling in Plants, Animals and Microorganisms 3 Course Prerequisite: MBIOS 513. New research on intra and extra cellular biochemical signaling, including communication in plants and hormone action in animals. (Crosslisted course offered as MBIOS 561, MPS 561).

570 Advanced Topics in Molecular Plant Sciences 1 May be repeated for credit; cumulative maximum 3 hours. Oral presentation of a current research paper. S, F grading.

587 Advanced Topics in Plant Biochemistry 3 Course Prerequisite: MBIOS 514.

600 Special Projects or Independent Study V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.

700 Master's Research, Dissertation and/or Examination V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

800 Doctoral Research, Dissertation and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Molecular Plant Science PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

School of Music

<http://music.wsu.edu>
Kimbrough 260
509-335-3898

Regents Professor and Director of the School of Music, G. Yasinitzky; Associate Director of Bands, Director of Athletic Bands, and Assistant Professor, T. Bennefield; Professors, R. Hare, D. Jarvis, D. Turnbull, L. Wiest; Associate Professors, M. Arksey, R. Boden, D. Luethi, K. McCarthy, J. Savage, K. Savage, J. Wieck; Assistant Professors, S. Blasco, D. Pham, S. Scott; Clinical Associate Professor, S. Converse; Clinical Assistant Professor, C. Dickey; Instructors, B. Ard, B. Carter, B. Edwards, D. Hagelganz, M. King, M. Mielke, S. Miller, M. Parkhurst, J. Schneider, D. Snider, F. Snider, B. Ward.

The School of Music prepares students for careers in music with degrees in performance, composition, and music education.

Vision

Music and its effective presentation are inextricable from the essential qualities of every world culture. WSU's School of Music, long recognized for excellence in performance and pedagogy, will therefore contribute to the advancement of music through widely visible and impactful creative activity, scholarship and research in selected aspects of music. It will sustain such advancement of the field through preparation of the next generation of

societal leaders whose involvement in music will range from appreciation of and support for music's value and centrality to its creation in professional performance, composition, and music education.

Mission

The School of Music supports the university's land-grant mission and tradition of service to society, while contributing substantially to the College of Arts and Sciences in creative activity, research and scholarship towards improving Cultural Understanding and International and Intercultural Relations. The mission focuses on:

- Advancing the field of music through internationally/nationally recognized achievements in composition, performance, recording, articles, books, conference presentations, and leadership in music education.
- Providing students university-wide superior musical experiences and preparing future professionals in music for successful careers as performers, composers, music educators, scholars, and leaders in a global society.
- Contributing to the cultural life of the university and region through the regular presentation of inspired and meaningful musical events.

See School of Music website for complete plan of Vision/Mission/Values/ Goals at <http://libarts.wsu.edu/music>.

Performance Studies in Music

Performance studies are offered on several levels to meet the needs of music majors as well as those of students from the general university community. There are no additional fees or tuition charges for the use of practice facilities. The 100-level performance studies are open to any student without audition through class instruction. The 200-level denotes group or private instruction for advanced non-music majors by special permission of the department chair (audition required).

Individual instruction in performance studies is offered at the 300- and 400-level for music majors and, by special permission of the department chair, to advanced non-music majors who meet all requirements for music majors as listed below. All students enrolled in 200-400-level performance instruction are required to attend weekly convocation (student recital), attend recitals as required, participate in at least one approved music department ensemble, and take applied jury examinations at the end of each term. A small tuition charge is assessed per 200-400-level course, not dependent on total credits. Students enrolled in 300- and 400-level performance study must enroll in a music theory or music history course each semester until music core requirements have been completed. No student will be permitted to enroll in 300-400-level performance studies unless these criteria are met. In addition, each music major must pass the piano proficiency exam, as a precondition to upper-division standing.

Performance studies may not be taken on a pass-fail basis.

Bachelor of Arts

This program is designed to offer a broad musical understanding within a liberal arts background. We expect that our graduating students be able to: 1) demonstrate mastery of music theory (an understanding of organizational patterns of music and their interaction, and of musical forms

and structures and the ability to employ this understanding in aural, verbal, and visual analyses); 2) competently perform on an instrument of choice (including voice) and effectively communicate on the literature for that instrument and for appropriate ensembles, and demonstrate a basic performance proficiency on the piano; 3) critically evaluate the history and development of music through the present time and place music in historical, cultural and stylistic contexts; 4) comprehend the basics of non-Western music and/or jazz, and demonstrate a rudimentary capacity to create derivative or original music both extemporaneously and in written form; and 5) work independently on a variety of musical problems by combining their capabilities in performance, analysis, composition and improvisation, and history and repertory. Students often elect a minor in another field.

Bachelor of Music

This program offers majors for specialization in performance, composition and music education. The curriculum is designed to prepare students as professional musicians, teachers, and practitioners of music. We expect that our graduating students be able to: 1) demonstrate mastery of music theory (an understanding of organizational patterns of music and their interaction, and of musical forms and structures and the ability to employ this understanding in aural, verbal, and visual analyses); 2) competently perform on an instrument of choice (including voice) and effectively communicate on the literature for that instrument and for appropriate ensembles, and demonstrate a basic performance proficiency on the piano; 3) critically evaluate the history and development of music through the present time and place music in historical, cultural and stylistic contexts; 4) comprehend the basics of non-Western music and/or jazz, and demonstrate a rudimentary capacity to create derivative or original music both extemporaneously and in written form; and 5) work independently on a variety of musical problems by combining their capabilities in performance, analysis, composition and improvisation, and history and repertory.

Music Performance and Composition

This major offers professional preparation in music with specialization in performance or composition. The curriculum is designed to prepare students to become professional performers in their respective major instrument or voice, or professional composers. Students following options in performance or composition are required to present an acceptable senior recital in the major performance medium, or compositions for composition majors. Students following options in performance are also required to present an acceptable junior recital in the major performance medium. Students pursuing Performance in Jazz Studies are limited to specific major performance instruments as stated in the degree description.

Music Education

This program offers professional preparation in music with specialization in music education. The curriculum is designed to prepare students as professional teachers of music. Students following any of the music education or elective studies options are required to present an acceptable senior half recital in the major performance medium.

Students following any of the music education options must have a minimum GPA of 2.5 in all of the following areas: cumulative GPA, Professional Education Core with a C or better in each course, and academic major (and minor if any) with a C or better in each course. Students certifying as majors in any of the music education options must also certify as majors in the College of Education.

Bachelor of Music in Music Education, option without endorsement

This degree provides valuable, current, and marketable options for students seeking pre-professional training in music, and in music education. Students in this option may opt to apply for the MA program of study in music at WSU where they may elect to complete courses required for a teaching endorsement and state certification. Admission to graduate school and the School of Music graduate program following completion of this degree is determined by application on an individual basis.

Master of Arts in Music

Please consult the current WSU Graduate Study Bulletin. For students pursuing the combined BM/MA with teacher certification in Music, please consult the department.

Theatre Courses

Benjamin Gonzales, Mary Trotter (College of Arts and Sciences)

Washington State University does not offer a major or minor in theatre arts, however, introductory courses in theatre, acting and related special topics are offered through the School of Music (See MUS 161 – Introduction to Theatre, MUS 162 – Introduction to Acting).

Schedule of Studies

Normal progress in all music degree curricula requires enrollment during the freshman year in 300-level performance studies. Such enrollment requires an audition which is best completed during the semester (usually spring) prior to the student's matriculating in the university. Students who do not audition early must do so during the first week of classes in the term. Normal progress also assumes placement in 200-level music theory. Theory placement tests will be administered as part of the performance audition. Students who do not qualify for 300-level performance studies and 200-level theory studies as freshmen will usually require more semesters and credit hours of performance studies to complete a degree than listed in this schedule of studies.

To certify as a major pursuing any degree in music, students must meet the following criteria:

Completion of 24 semester hours; cumulative GPA of 2.0; completion of 10 hours with a cumulative GPA of 2.0 and a grade of C or better in those courses selected: MUS 151, 181, 182, 251, 252, 253, 254, and up to four credits of applied study; approval of the appropriate applied study area coordinator; [approval requires two semesters' study as specified by each area: Keyboard at 300 level with grade of B- or better, Brass and Percussion at 300 level with grade of B- or better, Woodwinds at 300 level with grade of B- or better, and Voice at 200 level with grade of B- or better]; completion of application available from department. Students not passing

the upper-division exam after the second attempt will be decertified as music majors.

In addition the College of Education requires 2.5 GPA and C or better in each course listed for the major, minor and professional core, plus a 2.5 cumulative GPA, of students certifying in any of the Bachelor of Music in Music Education curricula.

As indicated in the requirements listed under the various majors and options for the Bachelor of Music degree and the Bachelor of Arts degree in Music, each student must satisfactorily complete all music courses with a minimum 2.5 GPA and a grade of C or better in each music course. Each student is required to pass the piano proficiency exam and the junior and/or senior qualifying exam, with the exception of those students enrolled in the Bachelor of Arts degree (the B.A. degree requires completion of MUS 182 with a C or better). Students must also complete the UCOREs plus those for the College of Arts and Sciences.

Student Learning outcomes

- **Critical, Creative and Musical Reasoning:** This includes learning to analyze and interpret music, to express the composer's intention, the character of the music and to convey the emotion of the work.
- **Quantitative and Symbolic Reasoning:** This involves taking the abstract symbols on the page and making musical sense of them, interpreting the rhythmic and pitch elements of the music and making expressive choices based on the notation on the page.
- **Information Literacy:** Musicians must understand the historical and cultural aspects of the music that they are performing to present a musically and artistically convincing performance. Also, students must become familiar with a wide range of important works from the musical canon.
- **Communication:** A musical performance is not successful unless there is communication with the audience.
- **Diversity:** To perform music of different styles and genres, it is essential to understand diverse cultures and musical views. This is related to information literacy.
- **Integration of Learning:** For a musical performance to be truly successful, all of these Learning Outcomes—creative thinking, symbolic reasoning, information literacy, communication and diversity must be integrated by the performer.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

BACHELOR OF ARTS IN MUSIC (120 HOURS)

This four-year program is designed to meet the needs of students wishing a broad liberal arts background with a major in music. Of the total 120 credits required for a degree in this program, 50 credits are in music and 70 credits are devoted to courses outside music, including the University Common Requirements (UCOREs). Non-music courses other than those used for the UCOREs must be at the 200-level or above. 40 credits of the 120 required

for the degree must be in 300-400-level. Other requirements include: achieve a cumulative 2.5 GPA and a grade of C or better in all music classes; senior qualifying exam; piano proficiency exam or grade of C or better in MUS 182.

Only 9 credits of MUS courses can be used to fulfill UCORE requirements.

First Year

<i>First Term</i>	<i>Hours</i>
Applied MUS ¹	2
ENGLISH 101 [WRTG]	3
MUS 164	1
MUS 181 ²	0 or 1
MUS 251 ³	3
MUS 252 ³	1
MUS Ensemble ⁴	1
Quantitative Reasoning [QUAN]	3

<i>Second Term</i>	<i>Hours</i>
(Non-MUS) Creative & Professional Arts [ARTS]	3
Applied MUS ¹	2
HISTORY 105 [ROOT]	3
MUS 182 ²	0 or 1
MUS 253 ⁵	3
MUS 254 ⁵	1
MUS Ensemble ⁴	1

Second Year

<i>First Term</i>	<i>Hours</i>
Applied MUS ¹	2
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ⁶	4
Communication [COMM] or Written Communication [WRTG]	3
MUS 351 ³	3
MUS 352 ³	1
MUS Ensemble ⁴	1
Social Sciences [SSCI]	3

<i>Second Term</i>	<i>Hours</i>
Applied MUS ¹	2
MUS 353 ⁵	3
MUS 354 ⁷	1
MUS 359 [HUM] [M] ⁷	3
MUS Ensemble ⁴	1
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ⁶	4
Complete Writing Portfolio	
Pass Piano Proficiency	

Third Year

<i>First Term</i>	<i>Hours</i>
(Non-MUS) Diversity [DIVR]	3
MUS 360 [HUM] [M] ⁸	3
MUS Ensemble ⁴	1
Foreign Language and/or Non-MUS Electives ⁹	8

<i>Second Term</i>	<i>Hours</i>
MUS 461 [CAPS] ⁷	3
MUS Ensemble ⁴	1
PHIL 103	3
Foreign Language and/or Non-MUS Electives ⁹	9

Fourth Year

<i>First Term</i>	<i>Hours</i>
300-400-level Music Electives	4
Non-MUS Electives ⁹	11

<i>Second Term</i>	<i>Hours</i>
300-400-level Music Electives	6
Non-MUS Electives ⁹	10

¹ Applied MUS (8 credits required): Approved courses include MUS 301-318, 320, 401-418, and 420.

² Class piano credits not required in degree.

³ Fall only.

⁴ Music Ensemble: 6 credits required from MUSIC 428-444 with a minimum of 2 credits choral (MUSIC 429, 430, 431) and 2 credits instrumental (MUSIC 434, 436, 437, 438)

⁵ Spring only.

⁶ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

⁷ Spring only.

⁸ Fall only.

⁹ Students must complete a minimum of 38 credits of 200-level or above electives outside of MUS and UCORE requirements. At least 5 credits must be at the 300-400 level. Please consult with advisor for elective selection.

BACHELOR OF MUSIC WITH ELECTIVE STUDIES IN EDUCATION (120 HOURS)

Students following any teacher preparation option are required to present an acceptable senior half recital in the major performance medium.

Students following any teacher preparation option must have a minimum GPA of 2.5 in all of the following areas: cumulative GPA, Professional Education Core with a C or better in each course, and academic major (and minor if any) with a C or better in each course. Students must also certify as majors in the College of Education. Since this option is likely to lead to enrollment in the MA in Music, students are advised that admission to graduate study requires a 3.0 cumulative GPA.

Students must pass the Piano Proficiency Exam, pass the senior qualifying exam, achieve a cumulative 2.5 GPA and a grade of C or better in all music classes, and a 2.5 GPA and a grade of C or better in all College of Education Professional Core courses. Class piano credits are not required for the degree. Instrumentalists must complete 4 credits in vocal performance studies (private lessons and/or ensemble) and vocalists must complete 4 credits of instrumental performance studies. Approved Performing Ensembles: See degree requirements for applicable (desired) endorsement.

This option provides professional preparation in music combined with studies in education. Students may complete teacher certification requirements after completion of this degree through further enrollment as undergraduate second degree candidates, enrollment as post-baccalaureate non-degree students, or as graduate students, each of which requires application for admission. Students planning to seek admission and enroll as graduate students should, at the beginning of their last semester of undergraduate study, complete the necessary form to count selected courses in the final undergraduate semester toward the graduate degree, up to a maximum of 6 credits.

As stated above, this option may lead to one of three paths to achieve teacher certification in designated arts: Music (choral, instrumental, and general). If a student elects to pursue teacher certification, requirements include: C or better in all music and education courses; 2.5 music average; 2.5 education average; 2.5 overall average; 4 credits vocal performance for instrumentalists; 4 credits instrumental performance for vocalists; upper-division exam, piano proficiency, solo half-recital. Approved performing groups: a minimum of 1 credit during each of 7 semesters, to include at least one semester of MUS 435 for instrumentalists and 428 for vocalists. Include a minimum of 2 credits in choral and 2 credits in instrumental performing groups. Note that during the second term of the senior year, only 10 credits are taken toward the degree. Students must enroll in 12 credits to be full time and may enroll in graduate credits if preparing to enroll in the MA degree program.

Only 9 credits of MUS courses can be used to fulfill UCORE requirements.

First Year

<i>First Term</i>	<i>Hours</i>
Applied MUS ¹	2
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ²	4
ENGLISH 101 [WRTG]	3
MUS 164	1
MUS 181 ³	0 or 1
MUS 251 ⁴	3
MUS 252 ⁴	1
MUS Ensemble ⁵	1

<i>Second Term</i>	<i>Hours</i>
Applied MUS ¹	2
HISTORY 105 [ROOT]	3
MUS 182 ³	0 or 1
MUS 190	1
MUS 253 ⁶	3
MUS 254 ⁶	1
MUS Ensemble ⁵	1
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ²	4
Quantitative Reasoning [QUAN]	3

Second Year

<i>First Term</i>	<i>Hours</i>
Applied MUS ¹	2
MUS 103 or 319	2
MUS 281	0 or 1
MUS 351 ⁴	3
MUS 352 ⁴	1
MUS 491 ⁴	2
MUS Ensemble ⁵	1
TCH LRN 301	3

<i>Second Term</i>	<i>Hours</i>
Applied MUS ¹	2
MUS 353 ⁶	3
MUS 354 ⁶	1
MUS 359 [HUM] [M] ⁶	3
MUS 490 ⁶	3
MUS Ensemble ⁵	1
TCH LRN 317	2
Pass Piano Proficiency	
Complete Writing Portfolio	
May Field Experience	
Certify Major, Certify TCH LRN	

Third Year

	<i>Hours</i>
<i>First Term</i>	
(Non-MUS) Diversity [DIVR]	3
Applied MUS ¹	2
ENGLISH 201 [WRTG] ⁷	3
MUS 258 ⁴	2
MUS 360 [HUM] [M] ⁴	3
MUS 455 ⁴	2
MUS Ensemble ⁵	1

	<i>Hours</i>
<i>Second Term</i>	
(Non-MUS) Creative & Professional	
Arts [ARTS]	3
Applied MUS ¹	2
MUS 428 or 435	1
MUS 461 [CAPS] ⁶	3
MUS Electives	3
Social Sciences [SSCI]	3

Fourth Year

	<i>Hours</i>
<i>First Term</i>	
Applied MUS ¹	2
Foreign Language, if needed	0-4
MUS Endorsement Electives ⁸	4
MUS Ensemble ⁵	1
TCH LRN 464	3
TCH LRN 465	3
Senior Qualifying Exam	
Reserve Credit for MA recommended	

	<i>Hours</i>
<i>Second Term</i>	
ED PSYCH 468	3
Foreign Language, if needed	0-4
MUS 482 or 483	1
MUS Endorsement Electives ⁸	4
TCH LRN 467 [M]	3
TCH LRN 470	3
Senior Half-Recital	
Reserve Credit for MA recommended	

¹ Applied Music: 14 credits required with a minimum of 2 credits at the 400 level. Approved courses include MUS 301-318, 320, 401-418, 420.

² To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

³ Class piano credits not required in degree.

⁴ Fall only.

⁵ Music ensemble: 6 credits required from MUS 428-444 with a minimum of 2 credits choral (MUS 429, 430, 431), and 2 credits instrumental (MUS 434, 436, 437, 438)

⁶ Spring only.

⁷ One from ENGLISH 201, 301, 302, or 402 is required for admission to the Teacher Education Program. Students who take ENGLISH 302 will need to take an additional [WRTG] or [COMM] course.

⁸ MUS Endorsement Electives (8 credits required including at least 1 term MUS 480): Approved courses include MUS 480, 482, 483, 487, 489, 493, and 494.

MUSIC COMPOSITION DEGREE (120 HOURS)

This major offers professional preparation in music with specialization in composition. The curriculum is designed to prepare students in contemporary classical composition and allied fields.

Requirements include: senior qualifying exam; piano proficiency exam; achieve a cumulative 2.5 GPA and a grade of C or better in all music classes; senior recital.

Only 9 credits of MUS courses can be used to fulfill UCORE requirements.

First Year

	<i>Hours</i>
<i>First Term</i>	
Applied MUS ¹	2
ENGLISH 101 [WRTG]	3
MUS 164	1
MUS 181 ²	0 or 1
MUS 251 ³	3
MUS 252 ³	1
MUS Ensemble ⁴	1
Foreign Language, if needed, or Non-MUS Electives ⁵	3-4

	<i>Hours</i>
<i>Second Term</i>	
Applied MUS ¹	2
HISTORY 105 [ROOT]	3
MUS 182 ²	0 or 1
MUS 253 ⁶	3
MUS 254 ⁶	1
MUS Ensemble ⁴	1
Quantitative Reasoning [QUAN]	3
Foreign Language, if needed	0-4

Second Year

	<i>Hours</i>
<i>First Term</i>	
Applied MUS ¹	2
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ⁷	4
Communication [COMM] or Written Communication [WRTG]	3
MUS 256	2
MUS 281 ²	0 or 1
MUS 351 ³	3
MUS 352 ³	1
MUS Ensemble ⁴	1

	<i>Hours</i>
<i>Second Term</i>	
Applied MUS ¹	2
MUS 256	2
MUS 353 ⁶	3
MUS 354 ⁶	1
MUS 359 [HUM] [M] ⁸	3
MUS Ensemble ⁴	1
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ⁷	4
Complete Writing Portfolio	
Pass Piano Proficiency	

Third Year

	<i>Hours</i>
<i>First Term</i>	
Applied MUS ¹	2
MUS 256	2
MUS 360 [HUM] [M] ³	3
MUS Electives	4
MUS Ensemble ⁴	1
Social Sciences [SSCI]	3

	<i>Hours</i>
<i>Second Term</i>	
(Non-MUS) Creative & Professional Arts [ARTS]	3
Applied MUS 202 or 302	2
MUS 451 ⁹⁸	2
MUS 456	4
MUS 461 [CAPS] ⁶	3
MUS 483	1
MUS Ensemble ⁴	1

Fourth Year

	<i>Hours</i>
<i>First Term</i>	
(Non-MUS) Diversity [DIVR]	3
Applied MUS 202 or 302	2
MUS 455 ³	2
MUS 456	4
MUS 482 ³	1
MUS Electives	3
MUS Ensemble ⁴	1
Senior Qualifying Exam	

	<i>Hours</i>
<i>Second Term</i>	
MUS 452 ⁶⁹	2
MUS 456	4
MUS Electives	4
MUS Ensemble ⁴	1
Non-MUS Electives ⁵	3
Senior Full Recital	

¹ Applied Music: 10 credits required in one musical instrument (MUSIC 304-318, 320, 404-418, 420);8 credits must be at the 300-400 level.

² Class piano credits not required.

³ Fall only.

⁴ Music Ensembles: 8 credits required from MUS 428, 429, 430, 431, 433, 434, 435, 436, 437, 438, 439, 440, 441, 444, with a minimum of 1 credit choral (MUSIC 429, 430, 431, 433, or 439).

⁵ Students must complete a minimum of 6 credits of electives outside of MUS and UCORE requirements. Please consult with advisor for elective selection.

⁶ Spring only.

⁷ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

⁸ Spring only.

⁹ Course taught alternate years.

MUSIC EDUCATION - CHORAL/GENERAL ENDORSEMENT OPTION (132 HOURS)

Students following any teacher preparation option are required to present an acceptable senior half recital in the major performance medium.

Students following any teacher preparation option must have a minimum GPA of 2.5 in all of the following areas: cumulative GPA, Professional Education Core with a C or better in each course, and academic major (and minor if any) with a C or better in each course. Students must also certify as majors in the College of Education.

Students must pass the Piano Proficiency Exam, pass the senior qualifying exam, achieve a cumulative 2.5 GPA and a grade of C or better in all music classes, and a 2.5 GPA and a grade of C or better in all College of Education Professional Core

courses. Class piano credits are not required for the degree. Vocalists must complete 4 credits of vocal performance studies.

This option provides teacher certification in designated arts: Music (choral and general). Requirements include: C or better in all music and education courses; 2.5 music average; 2.5 education average; 2.5 overall average; senior qualifying exam, piano proficiency, solo half-recital. Approved performing Ensembles: a minimum of 1 credit of ensemble during each of 7 semesters, including at least one credit of MUS 428, 433, or 439 and a minimum of 4 credits in vocal performing groups (MUS 429, 430, 431).

Only 9 credits of MUS courses can be used to fulfill UCORE requirements.

First Year

<i>First Term</i>	<i>Hours</i>
Applied MUS ¹	2
ENGLISH 101 [WRTG]	3
Foreign Language, if needed	0-4
MUS 164	1
MUS 181 ²	0 or 1
MUS 251 ³	3
MUS 252 ³	1
MUS Ensemble ⁴	1
Quantitative Reasoning [QUAN]	3
<i>Second Term</i>	<i>Hours</i>
Applied MUS ¹	2
ENGLISH 201 [WRTG] ⁵	3
Foreign Language, if needed	0-4
HISTORY 105 [ROOT]	3
MUS 182 ²	0 or 1
MUS 190	1
MUS 253 ⁶	3
MUS 254 ⁶	1
MUS Ensemble ⁴	1

Second Year

<i>First Term</i>	<i>Hours</i>
Applied MUS ¹	2
MUS 281 ²	0 or 1
MUS 351 ³	3
MUS 352 ³	1
MUS 491 ³	2
MUS Ensemble ⁴	1
Social Sciences [SSCI]	3
TCH LRN 301	3
<i>Second Term</i>	<i>Hours</i>
Applied MUS ¹	2
MUS 353 ⁶	3
MUS 354 ⁶	1
MUS 359 [HUM] [M] ⁶	3
MUS 490 ⁶	3
MUS Ensemble ⁴	1
TCH LRN 317	2
Pass Piano Proficiency	
May Field Experience	
Certify Major, Certify TCH LRN	
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
(Non-MUS) Diversity [DIVR]	3
Applied MUS ¹	2
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ⁷	4

MUS 360 [HUM] [M] ³	3
MUS 482 ³	1
MUS 488 ³⁸	2
MUS Ensemble ⁴	1

<i>Second Term</i>	<i>Hours</i>
(Non-MUS) Creative & Professional Arts [ARTS]	3
Applied MUS ¹	2
MUS 461 [CAPS] ⁶	3
MUS 483 ⁶	1
MUS 489 ⁶⁸	2
MUS Ensemble ⁴	1
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ⁷	4

Fourth Year

<i>First Term</i>	<i>Hours</i>
Applied MUS ¹	2
MUS 428, 433, or 439	1
MUS 455	2
MUS 480 ³	3
TCH LRN 464	3
TCH LRN 465	3
Senior Qualifying Exam	
<i>Second Term</i>	<i>Hours</i>
ED PSYCH 468	3
MUS 282	1
TCH LRN 467 [M]	3
TCH LRN 469	2
TCH LRN 470	3
Senior Half Recital	

Fifth Year

<i>First Term</i>	<i>Hours</i>
MUS 497	4
TCH LRN 415	12

¹ Applied Music: 14 credits required with a minimum of 2 credits at the 400 level. Approved courses include MUS 301-318, 320, 401-418, 420.

² Class piano credits not required in degree.

³ Fall only.

⁴ Music Ensemble: 6 credits of MUS 428-444 with a minimum of 4 credits choral (MUS 429, 430, 431).

⁵ One from ENGLISH 201, 301, 302, or 402 is required for admission to the Teacher Education Program. Students who take ENGLISH 302 will need to take an additional [WRTG] or [COMM] course.

⁶ Spring only.

⁷ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

⁸ Course taught alternate years.

MUSIC EDUCATION - CHORAL/ INSTRUMENTAL/GENERAL ENDORSEMENT OPTION (138 HOURS)

Students following any teacher preparation option are required to present an acceptable senior half recital in the major performance medium.

Students following any teacher preparation option must have a minimum GPA of 2.5 in all of

the following areas: cumulative GPA, Professional Education Core with a C or better in each course, and academic major (and minor if any) with a C or better in each course. Students must also certify as majors in the College of Education.

Students must pass the Piano Proficiency Exam, pass the senior qualifying exam, achieve a cumulative 2.5 GPA and a grade of C or better in all music classes, and a 2.5 GPA and a grade of C or better in all College of Education Professional Core courses. Class piano credits are not required for the degree. Instrumentalists must complete 4 credits in vocal performance studies (private lessons and/or ensemble) and vocalists must complete 4 credits of instrumental performance studies.

This option provides teacher certification in designated arts: music (choral, instrumental, and general). Requirements include: C or better in all music and education courses; 2.5 music average; 2.5 education average; 2.5 overall average; 4 credits vocal performance for instrumentalists; 4 credits instrumental performance for vocalists; senior qualifying exam, piano proficiency, solo half-recital. Approved performing groups: a minimum of 1 credit during each of 7 semesters, to include at least one semester of MUS 435 for instrumentalists and 428, 433, or 439 for vocalists. Within the 7 semesters/credits, a minimum of 2 credits in choral ensembles (MUS 429, 430, or 431) and 2 credits in instrumental ensembles (MUS 434, 436, 437, or 438).

Only 9 credits of MUS courses can be used to fulfill UCORE requirements.

First Year

<i>First Term</i>	<i>Hours</i>
Applied MUS ¹	2
ENGLISH 101 [WRTG]	3
Foreign Language, if needed	0-4
MUS 164	1
MUS 181 ²	0 or 1
MUS 251 ³	3
MUS 252 ³	1
MUS Ensemble ⁴	1
Quantitative Reasoning [QUAN]	3 or 4

<i>Second Term</i>	<i>Hours</i>
(Non-MUS) Diversity [DIVR]	3
Applied MUS ¹	2
ENGLISH 201 [WRTG] ⁵	3
HISTORY 105 [ROOT]	3
MUS 182 ²	0 or 1
MUS 190	1
MUS 253 ⁶	3
MUS 254 ⁶	1
MUS Ensemble ⁴	1

Second Year

<i>First Term</i>	<i>Hours</i>
(Non-MUS) Creative & Professional Arts [ARTS]	3
Applied MUS ¹	2
MUS 281 ²	0 or 1
MUS 351 ³	3
MUS 352 ³	1
MUS 491 ³	2
MUS Ensemble ⁴	1
TCH LRN 301	3

<i>Second Term</i>	<i>Hours</i>
Applied MUS ¹	2
MUS 281 ²	0 or 1

MUS 353⁶ 3
 MUS 354⁶ 1
 MUS 359 [HUM] [M]⁶ 3
 MUS 490⁶ 3
 MUS Ensemble⁴ 1
 TCH LRN 317 2
 Pass Piano Proficiency
 May Field Experience
 Certify Major, Certify TCH LRN
 Complete Writing Portfolio

Third Year

First Term Hours
 Applied MUS ¹ 2
 Biological Sciences [BSCI] with lab or
 SCIENCE 101 [SCI]⁷ 4
 MUS 360 [HUM] [M]³ 3
 MUS 482³ 1
 MUS 488³⁸ 2
 MUS Ensemble⁴ 1
 Social Sciences [SSCI] 3

Second Term Hours
 Applied MUS ¹ 2
 Foreign Language, if needed 0-4
 MUS 282 1
 MUS 461 [CAPS]⁶ 3
 MUS 483⁶ 1
 MUS 489⁶⁸ 2
 MUS Ensemble⁴ 1
 Physical Sciences [PSCI] with lab or
 SCIENCE 102 [SCI]⁷ 4

Fourth Year

First Term Hours
 Applied MUS ¹ 2
 MUS 435, or MUS 428, 433, or 439 1
 MUS 455 2
 MUS 480³ 3
 MUS 493³⁸ 2
 TCH LRN 464 3
 TCH LRN 465 3
 Senior Qualifying Exam

Second Term Hours
 ED PSYCH 468 3
 MUS 487⁶⁸ 2
 MUS 494⁶⁸ 2
 TCH LRN 467 3
 TCH LRN 469 2
 TCH LRN 470 3
 Senior Half-Recital

Fifth Year

First Term Hours
 MUS 497 4
 TCH LRN 415 12

¹ Applied Music: 14 credits required with a minimum of 2 credits at the 400 level. Approved courses include MUS 301-318, 320, 401-418, 420.

² Class piano credits not required in degree.

³ Fall only.

⁴ Music Ensemble: 6 credits required from MUSIC 428-444 with a minimum of 2 credits choral (MUSIC 429, 430, 431) and 2 credits instrumental (MUSIC 434, 436, 437, 438)

⁵ One from ENGLISH 201, 301, 302, or 402 is required for admission to the Teacher Education Program. Students who take ENGLISH 302 will need

to take an additional [WRTG] or [COMM] course.
⁶ Spring only.
⁷ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.
⁸ Course taught alternate years.

MUSIC EDUCATION - INSTRUMENTAL/ GENERAL ENDORSEMENT OPTION (133 HOURS)

Students following any teacher preparation option are required to present an acceptable senior half recital in the major performance medium.

Students following any teacher preparation option must have a minimum GPA of 2.5 in all of the following areas: cumulative GPA, Professional Education Core with a C or better in each course, and academic major (and minor if any) with a C or better in each course. Students must also certify as majors in the College of Education.

Students must pass the Piano Proficiency Exam, pass the senior qualifying exam, achieve a cumulative 2.5 GPA and a grade of C or better in all music classes, and a 2.5 GPA and a grade of C or better in all College of Education Professional Core courses. Class piano credits are not required for the degree. Instrumentalists must complete 4 credits in instrumental performance studies (private lessons and/or ensemble).

This option provides teacher certification in designated arts: Music (instrumental and general). Requirements include: C or better in all music and education courses; 2.5 music average; 2.5 education average; 2.5 overall average; 4 credits instrumental performance; senior qualifying exam, piano proficiency, solo half-recital. Approved performing groups: a minimum of 1 credit during each of 7 semesters, to include at least one credit of MUS 435 for instrumentalists, as well as a minimum of 4 credits in instrumental performing groups including 2 credits drawn from: MUS 434, 436, 437, or 438.

Only 9 credits of MUS courses can be used to fulfill UCORE requirements.

First Year

First Term Hours
 Applied MUS ¹ 2
 ENGLISH 101 [WRTG] 3
 Foreign Language, if needed 0-4
 MUS 164 1
 MUS 181² 0 or 1
 MUS 251³ 3
 MUS 252³ 1
 MUS Ensemble ⁴ 1
 Social Sciences [SSCI] 3

Second Term Hours
 Applied MUS ¹ 2
 Foreign Language, if needed 0-4
 HISTORY 105 [ROOT] 3
 MUS 182² 0 or 1
 MUS 190 1
 MUS 253³ 3
 MUS 254³ 1
 MUS Ensemble⁴ 1
 Quantitative Reasoning [QUAN] 3

Second Year

First Term Hours
 Applied MUS ¹ 2
 ENGLISH 201 [WRTG]⁶ 3
 MUS 281 0 or 1
 MUS 351³ 3
 MUS 352³ 1
 MUS 491³ 2
 MUS Ensemble⁴ 1
 TCH LRN 301 3

Second Term Hours
 Applied MUS ¹ 2
 MUS 353⁵ 3
 MUS 354⁵ 1
 MUS 359 [HUM] [M]⁵ 3
 MUS 483⁵ 1
 MUS 490⁵ 3
 MUS Ensemble⁴ 1
 TCH LRN 317 2
 Pass Piano Proficiency
 May Field Experience
 Certify Major, Certify TCH LRN
 Complete Writing Portfolio

Third Year

First Term Hours
 (Non-MUS) Diversity [DIVR] 3
 Applied MUS ¹ 2
 Biological Sciences [BSCI] with lab or
 SCIENCE 101 [SCI]⁷ 4
 MUS 360 [HUM] [M]³ 3
 MUS 482³ 1
 MUS Ensemble⁴ 1

Second Term Hours
 (Non-MUS) Creative & Professional
 Arts [ARTS] 3
 Applied MUS ¹ 2
 MUS 461 [CAPS]⁵ 3
 MUS Ensemble⁴ 1
 Physical Sciences [PSCI] with lab or
 SCIENCE 102 [SCI]⁷ 4

Fourth Year

First Term Hours
 Applied MUS ¹ 2
 MUS 435 1
 MUS 455³ 2
 MUS 480³ 3
 MUS 493³⁸ 2
 TCH LRN 464 3
 TCH LRN 465 3
 Senior Qualifying Exam

Second Term Hours
 ED PSYCH 468 3
 MUS 487⁵⁸ 2
 MUS 494⁵⁸ 2
 TCH LRN 467 [M] 3
 TCH LRN 469 2
 TCH LRN 470 3
 Senior-Half Recital

Fifth Year

First Term Hours
 MUS 497 4
 TCH LRN 415 12

¹ Applied Music: 14 credits required with a minimum of 2 credits at the 400 level. Approved courses include MUS 301-318, 320, 401-418, 420.

² Class piano credits not required in degree.

³ Fall only.

⁴ Music Ensemble: 6 credits required from MUS 428-444 with a minimum of 4 credits in instrumental performing groups, including 2 credits drawn from: MUS 434, 436, 437, or 438.

⁵ Spring only.

⁶ One from ENGLISH 201, 301, 302, or 402 is required for admission to the Teacher Education Program. Students who take ENGLISH 302 will need to take an additional [WRTG] or [COMM] course.

⁷ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

⁸ Course taught alternate years.

MUSIC PERFORMANCE - BRASS, PERCUSSION, STRINGS, WINDS OPTION (120 HOURS)

Requirements include: junior and senior qualifying exams; piano proficiency exam; achieve a cumulative 2.5 GPA and a grade of C or better in all music classes; junior and senior recitals.

Only 9 credits of MUS courses can be used to fulfill UCORE requirements.

First Year

<i>First Term</i>	<i>Hours</i>
(Non-MUS) Creative & Professional Arts [ARTS]	3
Applied MUS ¹	4
ENGLISH 101 [WRTG]	3
MUS 181 ²	0 or 1
MUS 251 ³	3
MUS 252 ³	1
MUS Ensemble ⁴	1

<i>Second Term</i>	<i>Hours</i>
Applied MUS ¹	4
HISTORY 105 [ROOT]	3
MUS 164	1
MUS 182 ²	0 or 1
MUS 253 ⁵	3
MUS 254 ⁵	1
MUS Ensemble ⁴	1
Quantitative Reasoning [QUAN]	3

Second Year

<i>First Term</i>	<i>Hours</i>
Applied MUS ¹	4
Communication [COMM] or Written Communication [WRTG]	3
MUS 351 ³	3
MUS 352 ³	1
MUS Ensemble ⁴	1
Social Sciences [SSCI]	3

<i>Second Term</i>	<i>Hours</i>
Applied MUS ¹	4
MUS 281 ²	0 or 1
MUS 353 ⁵	3
MUS 354 ⁵	1

MUS 359 [HUM] [M] ⁵	3
MUS 487, 493, or 494 ⁶	2
MUS Ensemble ⁴	1
Non-MUS Electives ⁷	1
Complete Writing Portfolio	
Pass Piano Proficiency	

Third Year

<i>First Term</i>	<i>Hours</i>
(Non-MUS) Diversity [DIVR]	3
Applied MUS ¹	4
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ⁸	4
MUS 360 [HUM] [M] ³	3
MUS 435	1
300-400-level MUS Electives	2
Junior Qualifying Exam	

<i>Second Term</i>	<i>Hours</i>
Applied MUS ¹	4
MUS 319	2
MUS 435	1
MUS 461 [CAPS] ⁵	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ⁸	4
300-400-level MUS Electives	2
Junior Recital	

Fourth Year

<i>First Term</i>	<i>Hours</i>
Applied MUS ¹	4
MUS 455 ³	2
MUS 465 ³⁹	2
MUS 482 ³	1
MUS Ensemble ⁴	1
300-400-level MUS Electives	4
Foreign Language, if needed	0-4
Senior Qualifying Exam	

<i>Second Term</i>	<i>Hours</i>
Applied MUS ¹	4
MUS Ensemble ⁴	1
Non-MUS Electives ⁷	3
300-400-level MUS Electives	4
Foreign Language, if needed	0-4
Senior Full Recital	

¹ Applied MUS 32 credits required with a minimum of 4 credits at the 400 level. Approved courses include MUS 304-318, 320, 404-418, and 420.

² Class piano credits not required.

³ Fall only.

⁴ Music Ensembles: 6 credits required from MUS 428, 429, 430, 431, 433, 434, 435, 436, 437, 438, 439, 440, 441, 444.

⁵ Spring only.

⁶ Two credits of pedagogy are required in respective area: string (487), wind/percussion (493) or brass (494).

⁷ Students must complete a minimum of 4 credits of electives outside of MUS and UCORE requirements. Please consult with advisor for elective selection

⁸ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

⁹ Course taught alternate years.

MUSIC PERFORMANCE - KEYBOARD OPTION (120 HOURS)

Requirements include: Accompany a junior, senior, or graduate recital; piano proficiency exam; junior and senior qualifying exams; junior recital; senior recital; achieve a cumulative 2.5 GPA and a grade of C or better in all music classes.

Only 9 credits of MUS courses can be used to fulfill UCORE requirements.

First Year

<i>First Term</i>	<i>Hours</i>
Applied MUS ¹	4
HISTORY 105 [ROOT]	3
MUS 164	1
MUS 251 ²	3
MUS 252 ²	1
MUS 441	1
Non-MUS Electives ³	3

<i>Second Term</i>	<i>Hours</i>
Applied MUS ¹	4
ENGLISH 101 [WRTG]	3
MUS 253 ⁴	3
MUS 254 ⁴	1
MUS 441	1
Quantitative Reasoning [QUAN]	3

Second Year

<i>First Term</i>	<i>Hours</i>
Applied MUS ¹	4
Communication [COMM] or Written Communication [WRTG]	3
MUS 351 ²	3
MUS 352 ²	1
MUS 441	1
Social Sciences [SSCI]	3

<i>Second Term</i>	<i>Hours</i>
Applied MUS ¹	4
MUS 353 ⁴	3
MUS 354 ⁴	1
MUS 359 [HUM] [M] ⁴	3
MUS 441	1
MUS 498	2
300-400-level MUS Electives	2
Complete Writing Portfolio	
Pass Piano Proficiency	

Third Year

<i>First Term</i>	<i>Hours</i>
(Non-MUS) Diversity [DIVR]	3
Applied MUS ¹	4
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ⁵	4
MUS 360 [HUM] [M] ²	3
MUS 435	1
MUS 465 ⁶²	2
Junior Qualifying Exam	

<i>Second Term</i>	<i>Hours</i>
Applied MUS ¹	4
MUS 441	1
MUS 461 [CAPS] ⁴	3
MUS 482 or 483	1
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ⁵	4
300-400-level MUS Electives	2
Junior Recital	

Fourth Year

<i>First Term</i>	<i>Hours</i>
(Non-MUS) Creative and Professional Arts [ARTS]	3
Applied MUS ¹	4
Foreign Language, if needed, or Non-MUS Electives ³	3-4
MUS 319	2
MUS 441	1
300-400-level MUS Electives	1
Accompaniment Recital	
Senior Qualifying Examination	
<i>Second Term</i>	
Applied MUS ¹	4
Foreign Language, if needed	0-4
Large Ensemble - MUS 429, 430, 431, 434, 436, 437, or 438	1
MUS 451 ⁴⁶	2
300-400-level MUS Electives	5
Senior Full Recital	

¹ Applied Music: 16 credits required with a minimum of 2 credits at the 400 level. Approved courses include MUS 301, 302, 401 and 402.

² Fall only.

³ Students must complete a minimum of 6 credits of electives outside of MUS and UCORE requirements. Please consult with advisor for elective selection.

⁴ Spring only.

⁵ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

⁶ Course taught alternate years.

MUSIC PERFORMANCE - KEYBOARD WITH ELECTIVE STUDIES IN PEDAGOGY OPTION (120 HOURS)

Requirements include: Accompany a junior, senior, or graduate recital; piano proficiency exam; junior and senior qualifying exams; junior recital; senior recital; achieve a cumulative 2.5 GPA and a grade of C or better in all music classes.

Only 9 credits of MUS courses can be used to fulfill UCORE requirements.

First Year

<i>First Term</i>	<i>Hours</i>
Applied MUS ¹	4
ENGLISH 101 [WRTG]	3
MUS 251 ²	3
MUS 252 ²	1
MUS 441	1
Quantitative Reasoning [QUAN]	3
<i>Second Term</i>	
Applied MUS ¹	4
HISTORY 105 [ROOT]	3
MUS 164	1
MUS 253 ³	3
MUS 254 ³	1
MUS 441	1
Foreign Language, if needed, or Non-MUS Electives ⁴	3-4

Second Year

<i>First Term</i>	<i>Hours</i>
Applied MUS ¹	4
Communication [COMM] or Written Communication [WRTG]	3
MUS 351 ²	3
MUS 352 ²	1
MUS 441	1
Social Sciences [SSCI]	3
<i>Second Term</i>	
Applied MUS ¹	4
MUS 353 ³	3
MUS 354 ³	1
MUS 359 [HUM] [M] ³	3
MUS 441	1
MUS 498	2
Complete Writing Portfolio	
Pass Piano Proficiency	

Third Year

<i>First Term</i>	<i>Hours</i>
Applied MUS ¹	4
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ⁵	4
MUS 360 [HUM] [M] ²	3
MUS 435	1
MUS 498	2
Junior Qualifying Exam	
<i>Second Term</i>	
Applied MUS ¹	4
MUS 441	1
MUS 461 [CAPS] ³	3
MUS 483 or 482	1
MUS 498	2
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ⁵	4
Junior Recital	

Fourth Year

<i>First Term</i>	<i>Hours</i>
Applied MUS ¹	4
MUS 319	2
MUS 441	1
MUS 465 ²⁶	2
PSYCH 361/490, TCH LRN 301	3
Foreign Language, if needed, or Non-MUS Electives ⁴	3-4
Senior Qualifying Exam	
Accompaniment Recital	
<i>Second Term</i>	
(Non-MUS) Creative & Professional Arts [ARTS]	3
(Non-MUS) Diversity [DIVR]	3
Applied MUS ¹	4
Large Ensemble - MUS 429, 430, 431, 434, 436, 437, or 438	1
MUS 451 ⁶³	2
Music Electives	3
Senior Full Recital	

¹ Applied Music: 16 credits required with a minimum of 2 credits at the 400 level. Approved courses include MUS 301, 302, 401 and 402.

² Fall only.

³ Spring only.

⁴ Students must complete a minimum of 6 credits of

electives outside of MUS and UCORE requirements. Please consult with advisor for elective selection.

⁵ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

⁶ Course taught alternate years.

MUSIC PERFORMANCE - PERCUSSION, SAXOPHONE, STRING BASS, TRUMPET, GUITAR, AND KEYBOARD (JAZZ STUDIES) (120 HOURS)

This option with an emphasis in jazz is available to students whose major instruments are percussion, saxophone, string bass, trumpet, guitar, or keyboard.

Requirements include: junior and senior qualifying exams; piano proficiency exam; achieve a cumulative 2.5 GPA and a grade of C or better in all music classes; junior and senior recitals.

Only 9 credits of MUS courses can be used to fulfill UCORE requirements.

First Year

<i>First Term</i>	<i>Hours</i>
(Non-MUS) Creative & Professional Arts [ARTS]	3
Applied MUS ¹	4
ENGLISH 101 [WRTG]	3
MUS 251 ²	3
MUS 252 ²	1
MUS Ensemble 428-431, 433-441, or 444 ³	1
<i>Second Term</i>	
Applied MUS ¹	4
HISTORY 105 [ROOT]	3
MUS 164	1
MUS 181 ⁴	0-1
MUS 253 ⁵	3
MUS 254 ⁵	1
MUS Ensemble 428-431, 433-441, or 444 ³	1
Quantitative Reasoning [QUAN]	3

Second Year

<i>First Term</i>	<i>Hours</i>
Applied MUS ¹	4
Communication [COMM] or Written Communication [WRTG]	3
MUS 182 ⁴	0-1
MUS 257 ²⁶	2
MUS 351 ²	3
MUS 352 ²	1
MUS Ensemble 428-431, 433-441, or 444 ³	1
Social Sciences [SSCI]	3
<i>Second Term</i>	
Applied MUS ¹	4
MUS 281 ⁴	0-1
MUS 353 ⁵	3
MUS 354 ⁵	1
MUS 359 [HUM] [M] ⁵	3
MUS Ensemble 428-431, 433-441, or 444 ³	1
Non-MUS Electives ⁷	3
Complete Writing Portfolio	
Pass Piano Proficiency	

Third Year

<i>First Term</i>	<i>Hours</i>
Applied MUS ¹	4
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ⁸	4
Jazz Ensemble - MUS 438, 439, or 440 ³	1
MUS 258 ²	2
MUS 360 [HUM] [M] ²	3
MUS 457 ²⁶	2
Junior Qualifying Exam	

<i>Second Term</i>	<i>Hours</i>
Applied MUS ¹	4
Jazz Ensemble - MUS 438, 439, or 440 ³	1
MUS 319	2
MUS 458 ⁵⁶	2
MUS 461 [CAPS] ⁵	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ⁸	4
Junior Recital	

Fourth Year

<i>First Term</i>	<i>Hours</i>
(Non-MUS) Diversity [DIVR]	3
Applied MUS ¹	4
Jazz Ensemble - MUS 438, 439, or 440 ³	1
MUS 362	3
MUS 482 ²	1
Foreign Language, if needed	0-4
Senior Qualifying Exam	

<i>Second Term</i>	<i>Hours</i>
Applied MUS ¹	4
Jazz Ensemble - MUS 438, 439, or 440 ³	1
MUS 483	1
MUS Electives	4
Foreign Language, if needed, or Non-MUS Electives ⁷	3-4
Senior Full Recital	

¹ Applied MUS courses (32 credits required with a minimum of 4 credits at the 400-level): MUS 202, 205, 209, 213, 218, 220, 302, 305, 309, 313, 318, 320, 402, 405, 409, 413, 418, and 420.

² Fall only.

³ Music Ensembles: a minimum of one credit per semester.

⁴ Class piano credits not required in degree.

⁵ Spring only.

⁶ Course taught alternate years.

⁷ Students must complete a minimum of 6 credits of electives outside of MUS and UCORE requirements. Please consult with advisor for elective selection.

⁸ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

MUSIC PERFORMANCE - VOICE OPTION (120 HOURS)

Requirements include: junior and senior qualifying exams; piano proficiency exam; achieve a cumulative 2.5 GPA and a grade of C or better in all music classes; junior and senior recitals.

Only 9 credits of MUS courses can be used to fulfill UCORE requirements.

First Year

<i>First Term</i>	<i>Hours</i>
(Non-MUS) Diversity [DIVR]	3
Applied MUS ¹	4
ENGLISH 101 [WRTG]	3
MUS 181 ²	0 or 1
MUS 251 ³	3
MUS 252 ³	1
MUS 429, 430, or 431	1

<i>Second Term</i>	<i>Hours</i>
Applied MUS ¹	4
HISTORY 105 [ROOT]	3
MUS 164	1
MUS 182 ²	0 or 1
MUS 253 ⁴	3
MUS 254 ⁴	3
MUS 429, 430, or 431	1
Quantitative Reasoning [QUAN]	3

Second Year

<i>First Term</i>	<i>Hours</i>
Applied MUS ¹	4
Communication [COMM] or Written Communication [WRTG]	3
MUS 351 ³	3
MUS 352 ³	1
MUS 371 ⁵³	2
MUS 429, 430, or 431	1

<i>Second Term</i>	<i>Hours</i>
Applied MUS ¹	4
MUS 281 ²	0 or 1
MUS 353 ⁴	3
MUS 354 ⁴	1
MUS 359 [HUM] [M] ⁴	3
MUS 372 ⁴⁵	2
MUS 429, 430, or 431	1
Complete Writing Portfolio	
Pass Piano Proficiency	

Third Year

<i>First Term</i>	<i>Hours</i>
Applied MUS ¹	4
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ⁶	4
MUS 360 [HUM] [M] ³	3
MUS 428, 433, or 439	1
MUS 429, 430, or 431	1
MUS 491 ³	2
Junior Qualifying Exam	

<i>Second Term</i>	<i>Hours</i>
(Non-MUS) Creative & Professional Arts [ARTS]	3
Applied MUS ¹	4
MUS 428	1
MUS 429, 430, or 431	1
MUS 461 [CAPS] ⁴	3
MUS 483 ⁴	1
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ⁶	4
Junior Recital	

Fourth Year

<i>First Term</i>	<i>Hours</i>
Applied MUS ¹	4
MUS 429, 430, or 431	1
MUS 465 ³⁵	2

Foreign Language, if needed, and/or Non-MUS Electives ⁷	7
Senior Qualifying Exam	

<i>Second Term</i>	<i>Hours</i>
Applied MUS ¹	4
MUS 429, 430, or 431	1
Social Sciences [SSCI]	3
Foreign Language, if needed, and/or Non-MUS Electives	7
Senior Full Recital	

¹ Applied Music: 32 credits of MUS 303 and 403 required with a minimum of 4 credits of MUS 403.

² Class piano credits not required.

³ Fall only.

⁴ Spring only.

⁵ Course taught alternate years.

⁶ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

⁷ Students must complete a minimum of 6 credits of electives outside of MUS and UCORE requirements. Please consult with advisor for elective selection.

Minors

Jazz Studies

Required courses: MUS 257, 258, 362, 457, 458, and one 3-credit MUS course; four credits from 438, 439, 440. Credit hours for the minor must include 9 hours of upper-division work taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Music Minor and Supporting Teaching Endorsements

Choose one of the following options: Option 1 includes MUS 151 and 2 credits from MUS 181, 182, 281 or 2 credits from MUS 102, 202, 302. Option 2 includes MUS 251 and 252. Both options also include MUS 160 and one course from MUS 262, 265, 362, MUS 163 or 363; 4 credits of performance studies, 4 credits performing groups; and 4 credits 300-400-level music electives. Also available are supporting teaching endorsements in music for students whose primary teaching endorsements are in other majors. Credit hours for the minor must include 9 hours of upper-division work taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Description of Courses

MUSIC

MUS

102 Piano 2 (0-6) May be repeated for credit.

103 Voice 2 (0-6) May be repeated for credit.

120 [ARTS] Class Guitar 3 Class instruction on basic guitar; repertoire will be selected from classical, jazz, rock, pop, fusion, and world music.

- 151 Music Fundamentals I** 3 Notation and performance of music fundamentals: pitch, rhythm, scales, key signatures, and intervals.
- 152 Music Fundamentals II** 3 Notation and performance of music fundamentals: melody, rhythm, scales, intervals, key signatures, triads; preparatory for MUS 251.
- 153 [ARTS] Musical Style in Composition** 3 Introduction to musical style in composition, history, and analysis including theory fundamentals, history survey, and beginning composition.
- 160 [ARTS] Survey of Music Literature** 3 Exploration of predominantly western music through demonstrations, performances, lectures, concerts, and discussions.
- 161 [ARTS] Introduction to Theatre** 3 An introduction to numerous areas of theatre, including: analysis, playwriting, directing, acting, technical theatre, and theatre history.
- 162 Introduction to Acting** 3 Introduction to the fundamentals of acting through exercises, writing, self-awareness, and attending theatre productions.
- 163 [ARTS] World Music** 3 Exploration of music from a global perspective through demonstrations, performances, lectures and discussion.
- 164 Introduction to Music Technology** 1 Course Prerequisite: MUS 151; MUS 251 or concurrent enrollment. Music notation software, audio recording and editing, and music specific web design.
- 181 Class Piano I** 1 (0-3) May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: By permission only. Pedal, sight reading, transposition, playing by ear, chord progressions, melody harmonization and improvisation.
- 182 Class Piano II** 1 (0-3) May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: MUS 181. Scales, arpeggios, blocked and broken chords; repertoire to complement individual skills, theoretical knowledge and improvisation.
- 190 Foundations of Music Education** 1 Methods and materials for becoming an effective music educator; includes observations and classroom teaching.
- 201 Organ** 2 (0-6) May be repeated for credit. By audition only.
- 202 Piano** 2 May be repeated for credit. By audition only.
- 203 Voice** 2 May be repeated for credit. Recommended preparation: Concurrent enrollment in MUS 431, 432, 433, 428 or 439.
- 204 Horn** 2 (0-6) May be repeated for credit.
- 205 Trumpet** 2 (0-6) May be repeated for credit.
- 206 Trombone** 2 (0-6) May be repeated for credit.
- 207 Euphonium** 2 (0-6) May be repeated for credit.
- 208 Tuba** 2 (0-6) May be repeated for credit.
- 209 Percussion** 2 (0-6) May be repeated for credit.
- 210 Violin** 2 (0-6) May be repeated for credit.
- 211 Viola** 2 (0-6) May be repeated for credit.
- 212 Violoncello** 2 (0-6) May be repeated for credit.
- 213 Contrabass** 2 May be repeated for credit.
- 214 Flute** 2 (0-6) May be repeated for credit.
- 215 Oboe** 2 (0-6) May be repeated for credit.
- 216 Clarinet** 2 (0-6) May be repeated for credit.
- 217 Bassoon** 2 (0-6) May be repeated for credit.
- 218 Saxophone** 2 May be repeated for credit.
- 220 Guitar** 2 May be repeated for credit. Guitar.
- 251 Materials and Structures of Music I** 3 Course Prerequisite: By examination only. See <http://libarts.wsu.edu/music/future-students/theory-exam.htm> for placement exam information. Music theory fundamentals; analysis and composition of two-voice counterpoint, diatonic harmony in choral and keyboard texture, and melodic form.
- 252 Applied Theory I** 1 (0-3) By examination. Ear training, conducting, rhythmic reading, sight singing, keyboard, dictation.
- 253 Materials and Structures of Music II** 3 Course Prerequisite: MUS 251 with a C or better; MUS 252. Analysis and composition of: figured bass, Alberti figures, and choral diatonic and initial chromatic harmony; modulation; alternation and binary forms.
- 254 Applied Theory II** 1 (0-3) Course Prerequisite: MUS 251 with a C or better; MUS 252 with a C or better. Ear training, sight singing, keyboard.
- 256 Seminar in Composition** 2 (0-6) May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: MUS 251 or concurrent enrollment. By Interview Only. Original writings in small forms.
- 257 Jazz Theory** 2 Introduction to jazz theory; chord symbols, extended harmony, scales and modes, voicing, bass lines and substitutions.
- 258 Introduction to Jazz Improvisation** 2 May be repeated for credit; cumulative maximum 4 hours. Introduction to jazz improvisation.
- 262 [ARTS] Rock Music: History and Social Analysis** 3 History and analysis of rock music related to its African American origins, its societal role, and its diverse development and impact.
- 265 [HUM] Native Music of North America** 3 Music and ceremonialism as a reflection of realities in North American native cultures, past and present. (Crosslisted course offered as MUS 265, CES 271).
- 266 [ARTS] Film Music** 3 The evolution of film music; discussions/lectures will address aesthetics of film music and how they influence perception, communication, and drama.
- 281 Class Piano III** 1 (0-3) May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: MUS 182. Principles, functional keyboard and improvisation.
- 282 Class Piano IV** 1 (0-3) May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: MUS 281 or Piano Proficiency Exam. Advanced skills, particularly for music education majors; score reading, transposition, sight-reading, and reduction of scores; ensemble skills.
- 301 Organ** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 302 Piano** V 2-4 May be repeated for credit.
- 303 Voice** V 2-4 May be repeated for credit. Recommended preparation: Concurrent enrollment in MUS 431 or 432.
- 304 Horn** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 305 Trumpet** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 306 Trombone** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 307 Euphonium** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 308 Tuba** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 309 Percussion** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 310 Violin** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 311 Viola** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 312 Violoncello** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 313 Contrabass** V 2-4 May be repeated for credit.
- 314 Flute** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 315 Oboe** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 316 Clarinet** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 317 Bassoon** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 318 Saxophone** V 2-4 May be repeated for credit.
- 319 Secondary Performance Study** 2 May be repeated for credit; cumulative maximum 16 hours. Course Prerequisite: By permission only. Instruction on instruments or voice other than major performing medium.
- 320 Guitar** V 2 (0-0) to 4 (0-12) May be repeated for credit. Guitar.
- 351 Materials and Structures of Music III** 3 Course Prerequisite: MUS 164 with a C or better; MUS 253 with a C or better; MUS 254 with a C or better. Voice leading and analysis of functional chromatic harmony; study of common large forms in the 17th, 18th, and 19th century.
- 352 Applied Theory III** 1 (0-3) Course Prerequisite: MUS 164 with a C or better; MUS 253 with a C or better; MUS 254 with a C or better. Continued musical development in ear training, sight singing, applied theory, keyboard dictation.

- 353 Materials and Structures of Music IV** 3 Course Prerequisite: MUS 351 with a C or better; MUS 352 with a C or better. Vertical, linear and formal relationships of 20th century music; writing, analysis, listening.
- 354 Applied Theory IV** 1 (0-3) Course Prerequisite: MUS 351 with a C or better; MUS 352 with a C or better. Continued development in ear training, sight singing, keyboard and dictation, emphasizing 20th century music.
- 359 [HUM] [M] History of Music: Antiquity to 1650** 3 Course Prerequisite: MUS 251 with a C or better; MUS 252 with a C or better; ENGLISH 101 with a C or better. History and style of western art music from Antiquity to 1650; introduction to and selected topics in ethnomusicology.
- 360 [HUM] [M] History of Music: 1650 - 1850** 3 Course Prerequisite: MUS 359 with a C or better. History and style of western art music from 1650 to 1850; selected topics in ethnomusicology.
- 362 [DIVR] History of Jazz** 3 History of jazz in chronological sequence; social and political contexts of the African-American origins of jazz; stylistic developments.
- 363 [DIVR] Women in Music** 3 Intersections of gender, class, race, and culture with popular and country music. (Crosslisted course offered as MUS 363, WOMEN ST 363).
- 364 Introduction to Sound Recording Technology** 3 Music, audio and recording technology throughout history and its influence on society and culture.
- 371 Diction for Singers I** 2 Italian and English; International Phonetic Alphabet; fundamental diction principles, applied to each language and oriented to needs of the singer.
- 372 Diction for Singers II** 2 Course Prerequisite: MUS 371. French and German; International Phonetic Alphabet; fundamental diction principles, applied to each language and oriented to needs of the singer.
- 388 Music for the Classroom Teacher** 2 Course Prerequisite: Certified major in Elementary Education; MUS 153. Singing, movement, listening and instrumental methods/resources for K-8 grades.
- 401 Organ** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 402 Piano** V 2-4 May be repeated for credit.
- 403 Voice** V 2-4 May be repeated for credit. Recommended preparation: Concurrent enrollment in MUS 431 or 432.
- 404 Horn** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 405 Trumpet** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 406 Trombone** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 407 Euphonium** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 408 Tuba** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 409 Percussion** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 410 Violin** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 411 Viola** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 412 Violoncello** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 413 Contrabass** V 2-4 May be repeated for credit.
- 414 Flute** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 415 Oboe** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 416 Clarinet** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 417 Bassoon** V 2 (0-6) to 4 (0-12) May be repeated for credit.
- 418 Saxophone** V 2-4 May be repeated for credit.
- 420 Guitar** V 2 (0-0) to 4 (0-12) May be repeated for credit. Guitar.
- 428 [ARTS] Opera Workshop** 1 (0-4) May be repeated for credit. Course Prerequisite: By audition only; see <http://libarts.wsu.edu/music/audition/index.htm> for details. Public performance may be required. Credit not granted for both MUS 428 and MUS 528.
- 429 [ARTS] Tenor/Bass Choir** 1 Vocal ensemble whose membership sings tenor or bass; no audition required; all students welcome; placement assessments will be administered first week of classes.
- 430 [ARTS] Treble Choir** 1 Vocal ensemble whose membership sings soprano or alto; no audition required; all students welcome; placement assessments will be administered first week of classes.
- 431 [ARTS] Concert Choir** 1 (0-4) May be repeated for credit. Course Prerequisite: By audition only; see <http://libarts.wsu.edu/music/audition/index.htm> for details. Auditioned choral ensemble studying and performing global music of varying cultures, language, period, style, and tradition. Credit not granted for both MUS 431 and MUS 531.
- 432 [ARTS] University Singers** 1 (0-4) May be repeated for credit. Public performance may be required. Non-auditioned choir consisting of 70+ singers. The majority of this group is made up of non-music majors.
- 433 [ARTS] Vocal Ensembles** 1 (0-4) May be repeated for credit. Course Prerequisite: By audition only; see <http://libarts.wsu.edu/music/audition/index.htm> for details. Study, rehearse, perform, and review original works and transcriptions for symphony orchestra; public performance each semester. Credit not granted for both MUS 433 and MUS 533.
- 434 [ARTS] Symphony Orchestra** 1 (0-4) May be repeated for credit. Study, rehearse, perform and review original works and transcriptions for symphony orchestra; public performance each semester.
- 435 Chamber Ensembles** 1 May be repeated for credit. Course Prerequisite: By audition only; see <http://libarts.wsu.edu/music/audition/index.htm> for details. Public performance may be required. Credit not granted for both MUS 435 and MUS 535.
- 436 [ARTS] Symphonic Band** 1 (0-4) May be repeated for credit. Large ensemble performance of repertoire for band. Public performances.
- 437 [ARTS] Wind Symphony** 1 (0-4) May be repeated for credit. Course Prerequisite: By audition only; see <http://libarts.wsu.edu/music/audition/index.htm> for details. Large ensemble; public performances each semester. Credit not granted for both MUS 437 and MUS 537.
- 438 [ARTS] Jazz-Lab Band** 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: By audition only; see <http://libarts.wsu.edu/music/audition/index.htm> for details. Jazz big band. Public performances each semester. Credit not granted for both MUS 438 and MUS 538.
- 439 [ARTS] Vocal Jazz Ensemble** 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: By audition only; see <http://libarts.wsu.edu/music/audition/index.htm> for details. The majority of this group is made up of non-music majors. Public performances each semester. Credit not granted for both MUS 439 and MUS 539.
- 440 Jazz Combos** 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: By audition only; see <http://libarts.wsu.edu/music/audition/index.htm> for details. Public performances each semester. Credit not granted for both MUS 440 and MUS 540.
- 441 Accompanying** 1 (0-4) May be repeated for credit.
- 444 Marching Band/Varsity Band** 1 (0-4) May be repeated for credit.
- 445 Seminar in Counterpoint** 2 May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: MUS 351 or concurrent enrollment. Contrapuntal techniques of the 16th and 18th century with original stylistic writing.
- 442 Electronic Music** 2 (1-3) Course Prerequisite: MUS 353 or concurrent enrollment. Introduction to computer-controlled digital, analog, and sampling synthesis; topics include sequencing, waveform editing, and creative projects.
- 445 Seminar in Instrumentation** 2 May be repeated for credit. Course Prerequisite: MUS 351 or concurrent enrollment. Scoring for various instrumental combinations.
- 446 Seminar in Advanced Composition** 4 May be repeated for credit. Course Prerequisite: MUS 351. By Interview Only. Original writing in small and large forms (traditional and experimental).
- 447 Seminar in Jazz Arranging/Composition** 2 Course Prerequisite: MUS 257. Arranging and composing for instrumental jazz ensembles.

- 458 Advanced Jazz Improvisation 2** May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: MUS 258. Advanced concepts in jazz improvisation.
- 459 Seminar in Advanced Jazz Composition V 1 (0-2) to 3 (0-6)** May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: MUS 457. Creation of works for Jazz Ensembles. Credit not granted for both MUS 459 and MUS 559.
- 461 [CAPS] The Musician in Society: Philosophies and Practices, 1850 - Present 3** Course Prerequisite: MUS 360 with a C or better; certified major in Music; junior standing. History and style of western art music from the late romantic period to the present, combining theories of history, theory, ethnomusicology, performance, pedagogy, and advocacy.
- 465 Seminar in Major Performance Literature 2** May be repeated for credit; cumulative maximum 6 hours. Survey/performance of solo and chamber literature for voice, keyboard, strings, winds, brass, percussion.
- 470 Marketing and Promotion for the Performing Arts 2 (1-3)** Components and techniques used in the marketing and promotion of the performing arts and the entertainment industry.
- 480 Instrumental Music Education 3** Course Prerequisite: Certified major in Music. Philosophies, administration, organization, materials and methods for instrumental music education K-12. Credit not granted for both MUS 480 and MUS 580.
- 482 Instrumental Conducting 1 (0-3)** Techniques and patterns in conducting as applied to orchestra and band literature; score preparation and rehearsal techniques for instrumental ensembles.
- 483 Choral Conducting 1 (0-3)** Techniques and patterns in conducting as applied to choral literature; score preparation and rehearsal techniques for choral ensembles.
- 487 String Techniques 2 (0-6)** String techniques, materials and methods for music education majors.
- 488 Choral Methods and Materials I 2 (0-6)** Preparation in the administration of choral programs from auditions to the selection and rehearsal of choral literature. Credit not granted for both MUS 488 and MUS 588.
- 489 Choral Methods and Materials II 2** Course Prerequisite: MUS 488. Development of skills in choral arranging, curriculum construction, research, and job placement. Credit not granted for both MUS 489 and MUS 589.
- 490 General Music Material/Methods 3** Course Prerequisite: MUS 491. Materials and methods for general music education majors; multiculturalism, collaboration, developmental curriculum and research issues; addressing national standards; observations. Credit not granted for both MUS 490 and MUS 590.
- 491 Voice Pedagogy 2 (1-3)** Anatomy of the singing process; methodology of teaching voices in various learning and teaching styles. Credit not granted for both MUS 491 and MUS 591.
- 493 Wind and Percussion Techniques I 2 (0-6)** Brass, woodwind, and percussion techniques for music education majors.
- 494 Wind and Percussion Techniques II 2 (0-6)** Course Prerequisite: MUS 493. Brass, woodwind and percussion techniques; elementary instrument conducting for music education majors.
- 496 Topics in Music V 1-3** May be repeated for credit; cumulative maximum 6 hours. Advanced seminar with required projects in music history, literature, pedagogy, theory, composition or performance.
- 497 Directed Student Teaching in Music V 4-16** Course Prerequisite: By permission only. Supervised teaching in public schools, including seminars reflecting on effective teaching. S, F grading.
- 498 Piano Pedagogy Practicum 2** May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: MUS 202, 302, or 402. Supervised teaching in Piano Preparatory Lab School, including lesson planning and meetings with coordinator for critiques and suggestions. S, F grading.
- 499 Special Problems V 1-4** May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 501 Organ V 2 (0-6) to 4 (0-12)** May be repeated for credit.
- 502 Piano V 2-4** May be repeated for credit.
- 503 Voice V 2-4** May be repeated for credit. Recommended preparation: Concurrent enrollment in MUS 431 or 432.
- 504 Horn V 2 (0-6) to 4 (0-12)** May be repeated for credit.
- 505 Trumpet V 2 (0-6) to 4 (0-12)** May be repeated for credit.
- 506 Trombone V 2 (0-6) to 4 (0-12)** May be repeated for credit.
- 507 Euphonium V 2 (0-6) to 4 (0-12)** May be repeated for credit.
- 508 Tuba V 2 (0-6) to 4 (0-12)** May be repeated for credit.
- 509 Percussion V 2 (0-6) to 4 (0-12)** May be repeated for credit.
- 510 Violin V 2 (0-6) to 4 (0-12)** May be repeated for credit.
- 511 Viola V 2 (0-6) to 4 (0-12)** May be repeated for credit.
- 512 Violoncello V 2 (0-6) to 4 (0-12)** May be repeated for credit.
- 513 Contrabass V 2 (0-6) to 4 (0-12)** May be repeated for credit.
- 514 Flute V 2 (0-6) to 4 (0-12)** May be repeated for credit.
- 515 Oboe V 2 (0-6) to 4 (0-12)** May be repeated for credit.
- 516 Clarinet V 2 (0-6) to 4 (0-12)** May be repeated for credit.
- 517 Bassoon V 2 (0-6) to 4 (0-12)** May be repeated for credit.
- 518 Saxophone V 2-4** May be repeated for credit.
- 519 Secondary Performance Study V 1-2** May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: By permission only. Instruction on instruments or voice other than major performing medium.
- 520 Guitar V 2 (0-0) to 4 (0-12)** May be repeated for credit. Guitar.
- 522 Graduate Recital 2** Private screening and public performance as required within each performance emphasis.
- 528 [ARTS] Opera Workshop 1 (0-4)** May be repeated for credit. Course Prerequisite: By audition only; see <http://libarts.wsu.edu/music/audition/index.htm> for details. Public performance may be required. Credit not granted for both MUS 428 and MUS 528.
- 531 [ARTS] Concert Choir 1 (0-4)** May be repeated for credit. Course Prerequisite: By audition only; see <http://libarts.wsu.edu/music/audition/index.htm> for details. Auditioned choral ensemble studying and performing global music of varying cultures, language, period, style, and tradition. Credit not granted for both MUS 431 and MUS 531.
- 533 [ARTS] Vocal Ensembles 1 (0-4)** May be repeated for credit. Course Prerequisite: By audition only; see <http://libarts.wsu.edu/music/audition/index.htm> for details. Study, rehearse, perform, and review original works and transcriptions for symphony orchestra; public performance each semester. Credit not granted for both MUS 433 and MUS 533.
- 534 [ARTS] Symphony Orchestra 1 (0-4)** May be repeated for credit. Study, rehearse, perform and review original works and transcriptions for symphony orchestra; public performance each semester.
- 535 Chamber Ensembles 1** May be repeated for credit. Course Prerequisite: By audition only; see <http://libarts.wsu.edu/music/audition/index.htm> for details. Public performance may be required. Credit not granted for both MUS 435 and MUS 535.
- 537 [ARTS] Wind Symphony 1 (0-4)** May be repeated for credit. Large ensemble; public performances each semester. Credit not granted for both MUS 437 and MUS 537.
- 538 [ARTS] Jazz-Lab Band 1 (0-4)** May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: By audition only; see <http://libarts.wsu.edu/music/audition/index.htm> for details. Jazz big band. Public performances each semester. Credit not granted for both MUS 438 and MUS 538.

- 539 [ARTS] Vocal Jazz Ensemble 1** (0-4) May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: By audition only; see <http://libarts.wsu.edu/music/audition/index.htm> for details. The majority of this group is made up of non-music majors. Public performances each semester. Credit not granted for both MUS 439 and MUS 539.
- 540 Jazz Combos 1** (0-4) May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: By audition only; see <http://libarts.wsu.edu/music/audition/index.htm> for details. Public performances each semester. Credit not granted for both MUS 440 and MUS 540.
- 541 Accompanying 1** (0-4) May be repeated for credit.
- 550 Seminar in Analysis 2** May be repeated for credit; cumulative maximum 4 hours. Applications of analytical techniques to develop a basis for musical understanding and interpretation.
- 553 Seminar in Music Theory 2** May be repeated for credit; cumulative maximum 4 hours.
- 556 Graduate Seminar in Advanced Composition V 2** (1-2) to 3 (1-3) May be repeated for credit; cumulative maximum 10 hours. The creation of works for either traditional acoustic ensembles or electro-acoustic media.
- 559 Seminar in Advanced Jazz Composition V 1** (0-2) to 3 (0-6) May be repeated for credit; cumulative maximum 12 hours. Creation of works for Jazz Ensembles. Credit not granted for both MUS 459 and MUS 559.
- 560 Introduction to Graduate Studies in Music 2** Required of all graduate students in music. Basic bibliographic and research techniques; written presentations related to area of emphasis.
- 561 Seminar in Literature of 20th Century Music 2** Impressionism, expressionism, neoclassicism, neoromanticism, jazz and recent electronic music.
- 562 Seminar in Major Ensemble Literature 2** May be repeated for credit; cumulative maximum 6 hours. Ensemble literature for symphony orchestra, band, choral, or jazz ensembles.
- 566 Seminar in Music History 2** May be repeated for credit; cumulative maximum 6 hours. Various historic periods and composers.
- 575 Advanced Conducting V 2-3** May be repeated for credit. Rehearsing orchestras, bands, and choruses. Public performance may be required.
- 580 Instrumental Music Education 3** Philosophies, administration, organization, materials and methods for instrumental music education K-12. Credit not granted for both MUS 480 and MUS 580.
- 586 Seminar in Piano Pedagogy 2** Course Prerequisite: MUS 502. Materials and methods of teaching experiences.
- 588 Choral Methods and Materials I 2** (0-6) Preparation in the administration of choral programs from auditions to the selection and rehearsal of choral literature. Credit not granted for both MUS 488 and MUS 588.
- 589 Choral Methods and Materials II 2** Course Prerequisite: MUS 588. Development of skills in choral arranging, curriculum construction, research, and job placement. Credit not granted for both MUS 489 and MUS 589.
- 590 General Music Material/Methods 3** Materials and methods for general music education majors; multiculturalism, collaboration, developmental curriculum and research issues; addressing national standards; observations. Credit not granted for both MUS 490 and MUS 590.
- 591 Voice Pedagogy 2** (1-3) Anatomy of the singing process; methodology of teaching voices in various learning and teaching styles. Credit not granted for both MUS 491 and MUS 591.
- 596 Topics in Music V 1-3** May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: By permission only.
- 600 Special Projects or Independent Study V 1-18** May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination V 1-18** May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 702 Master's Special Problems, Directed Study, and/or Examination V 1-18** May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

Program in Naval Science

www.uidaho.edu/navyrotc/
2nd Floor, Hays Hall; University of Idaho
208-885-6333

The Navy-Marine Corps Officer Education Program, administered and taught by the NROTC staff at the University of Idaho, is open to men and women and offers scholarships leading to commissions in the United States Navy and Marine Corps. Normally, students enter the program at the beginning of their freshman year; however, selected students may enter up to the beginning of their junior year. Students

take up to 24 hours of professional courses taught by the NROTC staff officers. In addition to professional courses, NROTC students must participate in Naval Science Drill each semester. Following graduation and commissioning, new officers are offered a broad variety of duty assignments including duty on nuclear submarines and surface ships, in naval aviation, and ground or aviation assignments in the Marine Corps.

College Program

Application for this non-scholarship program is made directly to the head of the Department of Naval Science. Students receive their uniforms and naval science textbooks at no cost. When accepted into the Advanced Standing course as juniors, students will begin receiving a monthly stipend of \$350 per month. College Program students may be nominated by the Professor of Naval Science for a two- or three-year scholarship as freshmen or sophomores, if their academic and military aptitude marks are sufficient to warrant such nomination. The program requires one training cruise during the summer following the junior year. It is an afloat cruise of the same type and with the same pay as described for the Scholarship Program.

Scholarship Program

Naval Science (Navy or Marine-Option) Scholarship students' benefits include tuition, fees, a book allowance, and a monthly stipend of up to \$400. Application for this program is normally made during the early fall of the student's senior year of high school. Initial selections are based on college entrance examination scores (SAT or ACT) and high school academic and extra-curricular performance.

A student on scholarship participates in three summer training cruises of three to six weeks duration. During the first cruise, students are introduced to the submarine, amphibious warfare (Marine Week), surface warfare, and aviation communities. The second and third cruises are aboard ships of the Pacific or Atlantic fleets and often include travel to foreign ports. During summer cruises, the students receive one-half the pay of an ensign, in addition to room and board.

Marine Corps Option

Both male and female Scholarship and College Program students who desire a Marine Corps commission may apply for the Marine Corps option during their first two years in college. Students taking this option enroll in specialized classes on Marine Corps subjects during their junior year and participate in summer training at the Marine Corps Development and Education Center, Quantico, Virginia during the summer following their junior year.

Minors

Naval Science

N S 101, 102, 201, 202; four to six courses from the following: N S 301, 302, 311, 401, 402, 412. Credit hours for the minor must include 9 hours of upper-division work taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Program in Neuroscience

www.vetmed.wsu.edu/neuroscience/
Veterinary and Biomedical Research Bldg (VBR) 207
509-335-6624

Director, Chair, and Professor, S. Simasko; Associate Director of Graduate Program and Associate Professor, H. Jansen; Associate Director of Undergraduate Program and Clinical Assistant Professor, S. Gizerian; Regents Professors, J.M. Krueger, W.S. Ritter; Professors, G. Belenky (Spokane), M. Chandra, R.M. Craft, M. Frank (Spokane), J.W. Harding, J. Hinson, M. Morgan (Vancouver), J. Panksepp, C. Portfors (Vancouver), R. Quock, R.C. Ritter, M. Schmitter-Edgcombe, B.A. Sorg (Vancouver), H. Van Dongen (Spokane), P. Whitney; Associate Professors, S. Appleyard, R.L. Brown, W. Dong, R. Fuchs, L. Kapas, D. Lin, L. Sprunger, E. Szentirmai (Spokane), M. Varnum, A. Vasavada, B. Walker, G. Wayman, J. Wisor (Spokane); Assistant Professors, A. Coffin (Vancouver), J. Davis, A. Dimitrov (Vancouver), I. Karatsoreos, R. McLaughlin, J. Peters, D. Rossi, B. Tamer, J. Xu; Clinical Associate Professor, M. Layton (Spokane); Clinical Assistant Professors, C. Davis (Spokane), P. Meighan, S. Meighan; Additional Graduate Faculty, D. Boison, C. Burgoyne, S. Demirel, B. Fortune, H. Shen, D. Stenkamp, L. Wang; Associate Professor Emeritus, L. Churchill.

Neuroscience is the study of how the nervous system impacts physiology, behavior, and health. It seeks to answer questions at the molecular, cellular, systems, behavioral, cognitive, and societal levels through application of a wide array of approaches and techniques. Neuroscience research is critical not only to improving learning and performance, but also addresses some of the most vexing problems that prevent good health, as well as impacts the very nature on how we view ourselves as sentient beings. WSU has a neuroscience faculty engaged in numerous focuses with particular strengths in the areas of energy homeostasis, sleep, circadian biology, addiction, emotions and well-being, sensory processes, neuronal function, electrophysiology, and movement. The Program sponsors Bachelor of Science, Master of Science, and Doctor of Philosophy degrees, in addition to minors at the undergraduate level.

The undergraduate program for majors is designed for students interested in preparing for professional study in the health sciences (such as medical doctor or doctor of veterinary medicine), graduate school, or for those who wish to use their training in laboratory settings in universities, government organizations, or industry.

Computational neuroscience is an option within the undergraduate neuroscience major and links the information processing features of the nervous system with information processing of computer systems. Accordingly, the computational neuroscience track supplements the neuroscience core curriculum with information technology courses. In this way students learn not only of the brain and its information processing mechanisms, but also of modern computer hardware and software technologies. Upon completion of the four-year curriculum, a BS in Neuroscience will be awarded. Furthermore, the program is designed to allow students to acquire breadth in computation subjects or, alternatively, to focus on either software or hardware aspects of computation. Students

choosing to acquire breadth in computational subjects will be well prepared for graduate study in most areas of neural and biomedical science, including bioengineering. Students choosing a software or hardware focus may obtain a minor in either computer science or computer engineering.

Student Learning Outcomes for BS Neuroscience majors

Knowledge:

- Demonstrate knowledge of, and recognize the relationships between, the structure and function of molecules and tissues involved in neurobiological systems at all levels: molecular, cellular, and organismal.
- Recognize the impact that science has on culture, and vice versa.

Skills:

- Perform basic laboratory techniques used in neuroscience research and understand and apply principles of laboratory safety.
- Locate and retrieve scientific information and read, understand, and critically evaluate primary literature.
- Prepare oral and written reports in a standard scientific format.
- Apply the scientific process, including designing, conducting, and evaluating experiments and testing of hypotheses.
- Use mathematics and statistics to evaluate scientific evidence and interpret graphs and tables.

Attitudes:

- Recognize that all areas of science are integrated and interconnected.
- Appreciate scientific knowledge as something that is not static, but constantly expanding through the ongoing work of researchers.
- Value ethical conduct in science.
- Recognize that the best decision-making and policies are based on evidence.

Transfer Students

Transfer students must satisfy the program requirements for graduation. Science courses taken at other institutions will be evaluated and credits accepted where possible. Inquiries should be directed to the Associate Director of Undergraduate Program.

7-Year Honors Neuroscience/Veterinary Medicine Degree Program

Academically qualified undergraduate students who meet the highly selective criteria for admission to WSU's Veterinary Medical Program may apply to the 7-year BS/DVM degree program in neuroscience after completion of one year of Honors College coursework at WSU. If accepted into the program, the student will work toward a bachelor of science in neuroscience in the first three years of the program and work toward the doctor of veterinary medicine degree in the following four years. The first three years are a combination of WSU Honors College courses and regular university undergraduate courses that fulfill the pre-veterinary and Neuroscience major requirements. The last four years are the traditional doctor of veterinary medicine program, plus completion of an honors thesis. Prospective applicants must be admitted to the WSU Honors College and enrolled in Honors courses. See the Honors College for additional information.

Preparation for Graduate Study in Neuroscience

The graduate program prepares students for careers in academia, industry, and government service. Students work closely with faculty members who are internationally known for their research accomplishments in energy homeostasis, sleep, circadian biology, addiction, emotions and well-being, sensory processes, neuronal function, electrophysiology, and movement. Upon graduation, students with a doctoral degree are credible international experts in the area of their thesis research. They will have developed cutting edge technical research skills, be capable of independently organizing and writing publishable research manuscripts, know the fundamentals on how to write competitive research proposals, have a breadth of knowledge that enables them to critically evaluate neuroscience research, and finally, develop insights that help them identify areas ripe for future investigation. These skills are not only appropriate for basic research, but the ability to organize a set of sophisticated goals, identify a plan to accomplish those goals, and then successfully complete the plan are skills transferable to many jobs. Our graduates have gone on to excellent positions in tier-one research universities, teaching colleges, industry (e.g., biotechnology, pharmaceutical, and medical device), as well as professional schools (e.g., medical, veterinary, optometry).

To be eligible for admission, candidates must meet general Washington State University requirements outlined at the Graduate School website: <http://gradschool.wsu.edu/> in effect at the time of their admission, as well as the current graduate neuroscience program requirements.

Applicants to the Ph.D. or M.S. program are required to have a Bachelor's degree from an accredited higher education institution. Applicants must have a minimum grade point average of 3.0 (A=4.0) either on the basis of the last 60 graded semester or 90 graded quarter hours of undergraduate study or basic science portion of a graduate or professional curriculum (first 60 credit hours). Applicants should have completed courses in inorganic and organic chemistry, biochemistry, calculus, physics and a minimum of three courses in different areas of the biological sciences. It is advisable that applicants have a basic statistics course prior to entering the neuroscience program.

Applications for admission to the program must include a completed graduate school application form, GRE test scores (subject tests are not required), official transcripts for all college-level course work, three letters of recommendation from references capable of judging aptitude and capability for graduate study by the applicant, a statement by the applicant that describes career goals and research interests, a writing sample (3-5 pages in length on scientific subject matter. It could be a senior research project or a sole author science-based published paper), and a resume; or curriculum vitae (CV). For students whose native language is not English, TOEFL scores are also required (minimum score is 100). Inquiries should be directed to the Program in Neuroscience, Department of Integrative Physiology and Neuroscience; Washington State University, Pullman, WA 99164-7620 or email grad.neuro@vetmed.wsu.edu.

Students normally begin their studies in the fall semester, which starts the latter part of August.

Applicants are offered admission on a rolling basis, but may be notified of acceptance as late as April 15. Students may still apply for admission after December, but graduate stipends may not be available for late applicants.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

NEUROSCIENCE - COMPUTATIONAL (BREADTH OF FIELD EMPHASIS) (128 HOURS)

Students may certify in computational neuroscience after completing a minimum of 24 semester hours with a 3.0 minimum GPA overall, and a minimum 3.0 GPA in BIOLOGY 106, BIOLOGY 107, CHEM 105, CHEM 106 or 116, MATH 171, MATH 172, and PHYSICS 201 or 205.

First Year

First Term	Hours
CHEM 105 [PSCI]	4
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3
HISTORY 105 [ROOT]	3
MATH 171 [QUAN]	4

Second Term	Hours
BIOLOGY 107 [BSCI]	4
CHEM 106	4
CPT S 121	4
MATH 172	4

Second Year

First Term	Hours
BIOLOGY 106	4
MATH 273	2
PHIL 201	3
PHYSICS 201	4
PSYCH 105 [SSCI]	4

Second Term	Hours
Humanities [HUM]	3
CHEM 345	4
CPT S 122	4
NEUROSCI 301	3
PHYSICS 202	4
Complete Writing Portfolio	4

Third Year

First Term	Hours
Diversity [DIVR]	3
E E 214	4
MATH 216	3
MATH 220	2
MBIOS / BIOLOGY 301	4

Second Term	Hours
Communication [COMM] or Written Communication [WRTG] ¹	3
MATH 315	3
MBIOS 303	4
NEUROSCI 404	4

Fourth Year

First Term	Hours
E E 261	3
E E 262	1
NEUROSCI 425	3
NEUROSCI 426	1
NEUROSCI 430 [M]	4
Computational Neuroscience Electives ²	6

Second Term	Hours
BIO ENG 340	4
NEUROSCI 403 [M]	3
NEUROSCI 490 [CAPS]	3
Computational Neuroscience Electives ²	3

¹ Professional or Technical Writing is recommended (e.g. ENGLISH 201 or 402)

² The Breadth of Field emphasis option requires a minimum of 9 elective credits, of which at least 3 must be E E or CPT S courses at 300/400 level. Approved Computational Neuroscience electives include: BIOLOGY 315, 321, 340, 438, 456; BIO ENG 481; CPT S 322, 421, 422, 423, 434, 440, 443; E E 311, 321, 324, 341, 451, 464; MBIOS 305, 401, 404, 413, 478; NEUROSCI 305, 409; Psych 470, 490, 491; PHYSICS 466. Courses may not be used to fulfill more than one requirement. Other courses may be allowed by department consent. Please see your advisor.

NEUROSCIENCE - COMPUTATIONAL (HARDWARE EMPHASIS) (128 HOURS)

Students may certify in computational neuroscience after completing a minimum of 24 semester hours with a 3.0 minimum GPA overall, and a minimum 3.0 GPA in BIOLOGY 106, BIOLOGY 107, CHEM 105, CHEM 106 or 116, MATH 171, MATH 172, and PHYSICS 201 or 205.

First Year

First Term	Hours
CHEM 105 [PSCI]	4
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3
HISTORY 105 [ROOT]	3
MATH 171 [QUAN]	4

Second Term	Hours
BIOLOGY 107 [BSCI]	4
CHEM 106	4
CPT S 121	4
MATH 172	4

Second Year

First Term	Hours
BIOLOGY 106	4
MATH 273	2
PHIL 201	3
PHYSICS 201	4
PSYCH 105 [SSCI]	4

Second Term	Hours
CHEM 345	4
CPT S 122	4
Humanities [HUM]	3
NEUROSCI 301	3
PHYSICS 202	4
Complete Writing Portfolio	4

Third Year

First Term	Hours
BIOLOGY / MBIOS 301	4
Communication [COMM] or Written Communication [WRTG] ¹	3
E E 214	4
MATH 216	3
MATH 220	2

Second Term	Hours
Diversity [DIVR]	3
MATH 315	3
MBIOS 303	4
NEUROSCI 404	4

Fourth Year

First Term	Hours
E E 234	4
E E 261	3
E E 262	1
NEUROSCI 425	3
NEUROSCI 426	1
NEUROSCI 430 [M]	4

Second Term	Hours
E E 324 [M]	4
NEUROSCI 403 [M]	3
NEUROSCI 490 [CAPS]	3
Computational Neuroscience Electives ²	5

¹ Professional or Technical Writing is recommended (e.g. ENGLISH 201 or 402)

² The Breadth of Field emphasis option requires a minimum of 9 elective credits, of which at least 3 must be E E or CPT S courses at 300/400 level. Approved Computational Neuroscience electives include: BIOLOGY 315, 321, 340, 438, 456; BIO ENG 481; CPT S 322, 421, 422, 423, 434, 440, 443; E E 311, 321, 324, 341, 451, 464; MBIOS 305, 401, 404, 413, 478; NEUROSCI 305, 409; Psych 470, 490, 491; PHYSICS 466. Courses may not be used to fulfill more than one requirement. Other courses may be allowed by department consent. Please see your advisor.

NEUROSCIENCE - COMPUTATIONAL (SOFTWARE EMPHASIS) (123 HOURS)

Students may certify in computational neuroscience after completing a minimum of 24 semester hours with a 3.0 minimum GPA overall, and a minimum 3.0 GPA in BIOLOGY 106, BIOLOGY 107, CHEM 105, CHEM 106 or 116, MATH 171, MATH 172, and PHYSICS 201 or 205.

First Year

First Term	Hours
CHEM 105 [PSCI]	4
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3
HISTORY 105 [ROOT]	3
MATH 171 [QUAN]	4

Second Term	Hours
BIOLOGY 107 [BSCI]	4
CHEM 106	4
CPT S 121	4
MATH 172	4

Second Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106	4
PHIL 201	3
PHYSICS 201 or 205	4
PSYCH 105 [SSCI]	3

<i>Second Term</i>	<i>Hours</i>
CHEM 345	4
CPT S 122	4
NEUROSCI 301	3
PHYSICS 202 or 206	4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG] ¹	3
E E 214	4
Humanities [HUM]	3
MATH 216	3
MBIOS 301	4

<i>Second Term</i>	<i>Hours</i>
CPT S 223	3
Diversity [DIVR]	3
MBIOS 303	4
NEUROSCI 404	4
PSYCH 490	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
CPT S 224	2
CPT S 440	3
NEUROSCI 425	3
NEUROSCI 426	1
NEUROSCI 430 [M]	4

<i>Second Term</i>	<i>Hours</i>
CPT S 322	3
NEUROSCI 403 [M]	3
NEUROSCI 490 [CAPS]	3
Computational Neuroscience Electives ²	5

¹ Professional or Technical Writing is recommended (e.g. ENGLISH 201 or 402)

² The Breadth of Field emphasis option requires a minimum of 9 elective credits, of which at least 3 must be E E or CPT S courses at 300/400 level. Approved Computational Neuroscience electives include: BIOLOGY 315, 321, 340, 438, 456; BIO ENG 481; CPT S 322, 421, 422, 423, 434, 440, 443; E E 311, 321, 324, 341, 451, 464; MBIOS 305, 401, 404, 413, 478; NEUROSCI 305, 409; Psych 470, 490, 491; PHYSICS 466. Courses may not be used to fulfill more than one requirement. Other courses may be allowed by department consent. Please see your advisor.

NEUROSCIENCE - GENERAL OPTION (120 HOURS)

Students may certify in general neuroscience (including Pre-Medical/Pre-Dental and Pre-Veterinary options) after completing a minimum of 24 semester hours with a 3.0 minimum GPA overall, and a 3.0 minimum GPA in BIOLOGY 106, BIOLOGY 107, CHEM 105, CHEM 106 or 116, MATH 140 or 171, PHYSICS 101 or 201 or 205, and PHYSICS 102 or 202 or 206 or CHEM 345.

First Year

<i>First Term</i>	<i>Hours</i>
CHEM 105 [PSCI]	4
ENGLISH 101 [WRTG]	3
MATH 140 [QUAN] or 171 [QUAN]	4
NEUROSCI 138	1
PSYCH 105 [SSCI]	3

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 107 [BSCI]	4
CHEM 106	4
Creative & Professional Arts [ARTS]	3
HISTORY 105 [ROOT]	3

Second Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106	4
CHEM 345	4
Communication [COMM] or Written Communication [WRTG]	3
PHYSICS 101 or 201	4

<i>Second Term</i>	<i>Hours</i>
Diversity [DIVR]	3
NEUROSCI 301	3
PHYSICS 102 or 202	4
Neuroscience Electives ¹	5
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
Behavior Course ²	3
MBIOS 303	4
Statistics ³	4
Neuroscience Electives ¹	4

<i>Second Term</i>	<i>Hours</i>
Humanities [HUM]	3
NEUROSCI 404	4
Electives ⁴	9

Fourth Year

<i>First Term</i>	<i>Hours</i>
NEUROSCI 430 [M]	4
Electives ⁴	11

<i>Second Term</i>	<i>Hours</i>
NEUROSCI 403 [M]	3
NEUROSCI 490 [CAPS]	3
Electives ⁴	9

¹ Approved Neuroscience electives include: BIOLOGY 301, 315, 321, 340, 352, 353, 354, 438, 456; MATH 340; MBIOS 301, 304, 305, 401, 404, 413; NEUROSCI 305, 409/509, 425, 426; PSYCH 265, 312, 333, 350, 361, 372, 384, 464, 470, 490, 491; PHYSICS 466/566; VET PH 308. Other courses may be allowed by department consent. Please see your advisor.

² Choose one course from: BIOLOGY 438, BIOLOGY 456, PSYCH 470, PSYCH 491, NEUROSCI 305, or NEUROSCI 409.

³ Choose one course from: MATH/STAT 212, MATH 360, MATH 370, STAT 412, or PSYCH 311.

⁴ Additional elective choices should include a minimum of 9 credits at the 300-400 level.

NEUROSCIENCE - PRE-MEDICAL AND PRE-DENTAL OPTION (120 HOURS)

Students may certify in general neuroscience (including Pre-Medical/Pre-Dental and Pre-Veterinary options) after completing a minimum of 24 semester hours with a 3.0 minimum GPA overall, and a 3.0 minimum GPA in BIOLOGY 106, BIOLOGY 107, CHEM 105, CHEM 106 or 116, MATH 140 or 171, PHYSICS 101 or 201 or 205, and PHYSICS 102 or 202 or 206 or CHEM 345.

First Year

<i>First Term</i>	<i>Hours</i>
CHEM 105 [PSCI]	4
ENGLISH 101 [WRTG]	3
MATH 140 [QUAN] or 171 [QUAN]	4
NEUROSCI 138	1
PSYCH 105 [SSCI]	3

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 107[BSCI]	4
CHEM 106	4
Creative & Professional Arts [ARTS]	3
HISTORY 105 [ROOT]	3

Second Year

<i>First Term</i>	<i>Hours</i>
BIOLOGY 106	4
CHEM 345	4
Communication [COMM] or Written Communication [WRTG]	3
PHYSICS 101 or 201	4

<i>Second Term</i>	<i>Hours</i>
CHEM 348	4
Diversity [DIVR]	3
NEUROSCI 301	3
PHYSICS 102 or 202	4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
Behavior Course ¹	3
MBIOS 303	4
Statistics Course ²	4
Neuroscience Electives ³	5

<i>Second Term</i>	<i>Hours</i>
BIOLOGY/MBIOS 301	4
Humanities [HUM]	3
NEUROSCI 404	4
Electives ⁴	5
MCAT in Spring	

Fourth Year

<i>First Term</i>	<i>Hours</i>
NEUROSCI 430 [M]	4
Electives ⁴	11

<i>Second Term</i>	<i>Hours</i>
NEUROSCI 403 [M]	3
NEUROSCI 490 [CAPS]	3
Electives ⁴	9

¹ Choose one course from: BIOLOGY 438, BIOLOGY 456, PSYCH 470, PSYCH 491, NEUROSCI 305, or NEUROSCI 409.

² Choose one course from: MATH/STAT 212, MATH 360, MATH 370, STAT 412, or PSYCH 311.

³ Approved Neuroscience electives include: BIOLOGY 301, 315, 321, 340, 352, 353, 354, 438, 456; MATH 340; MBIOS 301, 304, 305, 401, 404, 413; NEUROSCI 305, 409, 425, 426; PSYCH 265, 312, 333, 350, 361, 372, 384, 464, 470, 490, 491; PHYSICS 466; VET PH 308. Courses may not be used to fulfill more than one requirement. Other courses may be allowed by department consent. Please see your advisor.

⁴ Additional elective choices should include a minimum of 9 credits at the 300-400 level. Consult your advisor regarding elective courses that may be required or recommended for admission into your future health-professions program.

NEUROSCIENCE - PRE-VETERINARY OPTION (120 HOURS)

Students may certify in general neuroscience (including Pre-Medical/Pre-Dental and Pre-Veterinary options) after completing a minimum of 24 semester hours with a 3.0 minimum GPA overall, and a 3.0 minimum GPA in BIOLOGY 106, BIOLOGY 107, CHEM 105, CHEM 106 or 116, MATH 140 or 171, PHYSICS 101 or 201 or 205, and PHYSICS 102 or 202 or 206 or CHEM 345.

First Year

First Term	Hours
CHEM 105 [PSCI]	4
ENGLISH 101 [WRTG]	3
MATH 140 [QUAN] or 171 [QUAN]	4
NEUROSCI 138	1
PSYCH 105 [SSCI]	3

Second Term	Hours
BIOLOGY 107 [BSCI]	4
CHEM 106	4
Creative & Professional Arts [ARTS]	3
HISTORY 105 [ROOT]	3

Second Year

First Term	Hours
BIOLOGY 106	4
CHEM 345	4
Communication [COMM] or Written Communication [WRTG]	3
PHYSICS 101 or 201	4

Second Term	Hours
BIOLOGY/MBIOS 301	4
Diversity [DIVR]	3
NEUROSCI 301	3
PHYSICS 102 or 202	4
Complete Writing Portfolio	

Third Year

First Term	Hours
Behavior Course ¹	3
MBIOS 303	4
Statistics Course ²	4
Neuroscience Electives ³	5

Second Term	Hours
Humanities [HUM]	3
NEUROSCI 404	4
Electives ⁴	9
Take GRE over the summer	

Fourth Year

First Term	Hours
NEUROSCI 430 [M]	4
Electives ⁴	11
Apply to Veterinary School	

Second Term	Hours
NEUROSCI 403 [M]	3
NEUROSCI 490 [CAPS]	3
Electives ⁴	9

¹ Choose one course from: BIOLOGY 438, BIOLOGY 456, PSYCH 470, PSYCH 491, NEUROSCI 305, or NEUROSCI 409.

² Choose one course from: MATH/STAT 212, MATH 360, MATH 370, STAT 412, or PSYCH 311.

³ Approved Neuroscience electives include: BIOLOGY 301, 315, 321, 340, 352, 353, 354, 438, 456; MATH 340; MBIOS 301, 304, 305, 401, 404, 413; NEUROSCI 305, 409, 425, 426; PSYCH 265, 312, 333, 350, 361, 372, 384, 464, 470, 490, 491; PHYSICS 466; VET PH 308. Courses may not be used to fulfill more than one requirement. Other courses may be allowed by department consent. Please see your advisor.

⁴ Additional elective choices should include a minimum of 9 credits at the 300-400 level. Consult your advisor regarding elective courses that may be required or recommended for admission to a DVM program.

Minors

Neuroscience

Students may apply for a minor in neuroscience once they have completed 60 semester credit hours and have a 2.75 GPA. However, they may take minor coursework at any time as long as they meet the prerequisites. A minor in neuroscience requires 16 credits in Neuroscience, with at least 13 at or above the 300-level. Courses needed to satisfy the minor must include NEUROSCI 301; three credits selected from NEUROSCI 305, 409, PSYCH 470, 491, BIOLOGY 438, or BIOLOGY 456; at least six credits selected from the following: NEUROSCI 403, 404, and 430; and up to four credits of neuroscience related elective coursework (see elective choices for Neuroscience Major). Upon the approval of the student's advisor, a student with a minor in neuroscience may include 500-level courses in the minor program, provided the student meets the graduate study requirements and, prior to registration, obtains the consent of the faculty member(s) teaching the course. Students must maintain a minimum 2.75 GPA to remain certified as a neuroscience minor. Credit hours for the minor must include 9 hours of upper-division work taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Description of Courses

NEUROSCIENCE

NEUROSCI

138 Neuroscience Seminar 1 May be repeated for credit; cumulative maximum 2 hours. Introduces new students to individual faculty research interests and helps students link personal interests to academic majors. S, F grading.

150 [BSCI] Art and the Brain 3 Explore networks involved in sensory perception; learn how art integrates perceptual experiences into works that affect our understanding of ourselves.

201 [COMM] Introduction to Communication in the Molecular Life Sciences 3 (1-4) Course Prerequisite: BIOLOGY 106 with a C or better or BIOLOGY 107 with a C or better. Analysis of primary literature and an introduction to scientific communication skills in the molecular life sciences. (Crosslisted course offered as NEUROSCI 201, MBIOS 201). Recommended preparation: Pre-certified or certified major in Biochemistry, Genetics & Cell Biology, Microbiology, or Neuroscience.

275 Special Topics: Study Abroad V 1-15 May be repeated for credit. S, F grading.

301 Foundations of Neuroscience 3 Course Prerequisite: CHEM 106; BIOLOGY 107. Structure and function of the nervous system from single neurons to behavior. Credit not granted for both NEUROSCI 301 and 302.

302 Foundations of Neuroscience - Honors 3 Course Prerequisite: CHEM 106; BIOLOGY 107; PHYSICS 101 with a B or better, PHYSICS 201 with a B or better, or PHYSICS 205 with a B or better. Basic concepts, analysis and discussion of the experimental foundations for understanding nervous system function. Credit not granted for both NEUROSCI 301 and 302.

305 Neurons, Genes, and Behavior 3 Course Prerequisite: NEUROSCI 301, 302, MBIOS 301, or PSYCH 372. In-depth exploration of the organization of the brain, and how this organization underlies behavior.

333 Techniques and Experimental Design in Neuroscience Research 4 (3-3) Course Prerequisite: NEUROSCI 301; MATH 140 or 171; PSYCH 311 or concurrent enrollment, STAT 212 or concurrent enrollment, STAT 360 or concurrent enrollment, STAT 370 or concurrent enrollment, or STAT 412 or concurrent enrollment. Representative modern neuroscience experiments are explored from a conceptual, technical, and design perspective.

403 [M] Cellular Neurobiology 3 Course Prerequisite: NEUROSCI 301 or NEUROSCI 302; MBIOS 303; certified Neuroscience major or minor. Cellular and molecular interactions occurring within the nervous system.

404 Neuroanatomy 4 (3-3) Course Prerequisite: NEUROSCI 301 or NEUROSCI 302. Fundamental principles of the organization and plans of circuitry of the nervous system.

- 409 Affective Neuroscience** 3 Course Prerequisite: NEUROSCI 301, NEUROSCI 302, or PSYCH 372. Brain mechanisms of human and animal emotions. Credit not granted for both NEUROSCI 409 and NEUROSCI 509.
- 425 Foundations of Medical Physiology** 3 Course Prerequisite: BIO ENG 210, MBIOS 301, MBIOS 303, NEUROSCI 301, NEUROSCI 302, or PSYCH 372. Integrated functioning of organ systems, focusing on mechanisms of disease, organ dysfunction, and disturbances to whole-animal homeostasis and health.
- 426 Foundations of Medical Physiology Lab** 1 (0-3) Course Prerequisite: Concurrent enrollment in NEUROSCI 425. Optional laboratory component of NEUROSCI 425. Practical analysis of organ function and health using medical diagnostic equipment and clinical cases.
- 430 [M] Principles of Neurophysiology** 4 (3-3) Course Prerequisite: BIOLOGY 107; NEUROSCI 301 or NEUROSCI 302; PHYSICS 102, 202 or 206. Advanced exploration of the principles underlying cellular, sensory, motor and integrative functions of the nervous system. Recommended preparation: MBIOS 303.
- 450 Honors Thesis Research** V 1-3 Course Prerequisite: Certified major in Neuroscience; admitted to Honors College. Laboratory research with emphasis on honors thesis or project directed by faculty.
- 480 Special Topics: Study Abroad** V 1-15 May be repeated for credit. S, F grading.
- 490 [CAPS] Senior Project** 3 Course Prerequisite: Senior standing; certified major in Neuroscience. Senior capstone course for students majoring in Neuroscience.
- 491 Senior Project-Poster** 1 Course Prerequisite: Senior standing; certified major in Neuroscience. Research project poster or oral presentation. S, F grading.
- 495 Directed Research** V 1-3 May be repeated for credit. Course Prerequisite: Certified major or minor in Neuroscience. Introduction to neuroscience research literature.
- 499 Special Problems** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Certified major or minor in Neuroscience. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 509 Affective Neuroscience** 3 Brain mechanisms of human and animal emotions. Credit not granted for both NEUROSCI 409 and NEUROSCI 509.
- 520 Fundamentals of Neuroscience** 4 (3-3) Functional aspects of the brain from cell membrane to higher integrative processes. Cooperative: Open to UI degree-seeking students.
- 526 Domestic and Exotic Animal Behavior** 2 (1-3) Course Prerequisite: Veterinary Medicine student. Focus on the medical relevance of behaviors that can cause diseases, and diseases that can lead to behavior problems in domestic and exotic animals. (Crosslisted course offered as VET MED 526, NEUROSCI 526). Cooperative: Open to UI degree-seeking students. S, M, F grading.
- 529 Integrative Neuroscience** 3 Basic biochemical processes in the nervous system and their significance for normal and abnormal function.
- 531 Neuroscience Laboratory Rotation** 1 (0-3) May be repeated for credit; cumulative maximum 2 hours. Fourteen-week rotation through each of two research laboratories; learning procedures and techniques in neuroscience. S, F grading.
- 540 Special Topics in Integrative Neuroscience** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Concepts and controversies in neuroscience involving integrative properties of cell systems.
- 541 Special Topics in Cellular and Molecular Neuroscience** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Concepts and controversies in neuroscience that involve nerve cell function and regulation.
- 542 Special Topics in Interdisciplinary Neuroscience** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Concepts and controversies in neuroscience that revolve around traditional approaches to nervous system study.
- 543 Special Topics in Behavioral/Clinical Neuroscience** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Concepts and controversies in neuroscience that involve normal and pathological aspects of behavior.
- 563 Deconstruction of Research** 3 Course Prerequisite: Graduate standing in a WSU biomedical based graduate program. Nature and development of scientific investigation through oral and written avenues, and methods of critical analyses applied to questions of biomedical interest. (Crosslisted course offered as NEUROSCI 563, GLANHLTH 563, MBIOS 563, VET MICR 563, VET PATH 563, VET PH 563).
- 590 Seminar** 1 May be repeated for credit; cumulative maximum 7 hours. Presented by advanced graduate students and faculty (both in INP and around WSU) on their research areas. S, F grading.
- 592 Research Writing and Seminar** 3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Graduate student in Neuroscience program. Essentials of oral and written scientific communication.
- 600 Special Projects or Independent Study** V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.

700 Master's Research, Thesis, and/or Examination V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Neuroscience PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

College of Nursing

nursing.wsu.edu
Spokane
509-324-7360

Dean and Professor, J. Griffin-Sobel; Associate Dean for Research and Professor, C. Corbett; Associate Dean for Academic Programs and Associate Professor, C. Fitzgerald; Director of PhD Program and Associate Professor, C. Barbosa-Leiker; Director of Doctor of Nursing Practice (DNP) Program, (vacant); Director of Master in Nursing and Certificate Programs and Professor, M. Haberman; Chair of Health Policy Administration Program and Professor, J. Kennedy; Director of RN to BSN Program and Clinical Associate Professor, L. Dekker; Director of Pre-Licensure Baccalaureate in Nursing Science Program and Clinical Assistant Professor, R. Townsend; Academic Director of Vancouver Nursing Programs and Associate Professor, L. Eddy; Academic Director of Tri-Cities Nursing Programs and Associate Professor, D. Nogueras; Academic Director of Yakima Nursing Programs and Clinical Associate Professor, S. Carollo; Professors, P. Butterfield, R. Hoeksel, J. Katz, J. Roll; Associate Professors, J. Banasik, K. Daratha, D. Doutrich, P. Eide, S. Murphy, J. Postma, J. Purath, M. Schiavenato, B. Severtsen, M. Shaw, K. Shishani, D. Smart, C. Van Son; Assistant Professors, D. Abshire, L. Brown, W. Buenzli, K. Colorafi, A. Davis, J. Dotson, S. Fritz, J. Graves, L. James, T. Klein, L. Nelson, C. Nguyen-Truong, G. Oneal, K. Sinclair, L. Ward, M. Wilson; Research Professor, T. Odom-Maryon; Associate Research Professor, Philip Butterfield; Assistant Research Professor, D. Crain; Clinical Professor, A. Hunter; Clinical Associate Professor, D. Duvall; Clinical Assistant Professors, D. Brinker, D. Dermody, S. Fincham, N. Lungstrom, A. Mason, M. Rasmor, B. Richardson; Senior Instructors, K. Anders, L. Hahn, C. Oliver, S. Perkins, M. Stucky, L. Wintersteen; Instructors, M. Allen, M. Aronow, K. Attwood, T. Barenz, S. Barron, J. Beebe, L. Berry, C. Brown, S. Campbell, T. Carlton, M. Castillo, J. Coffman, S. Edwards, R. Faubion, A. Fulton, S. Griffith, J. Griffin, M. J. Groebner, A. Guthrie, J. Hansen, M. Hennes, V. Hennessey, J. Hickman, , D. Hudzinski, L. Jimishian, M. Jones, L. Kifer, S. Matar Curnow, S. McFadden, M. McIntyre, M. Nouwens, R. O'Brien, K. Olson, L. Parisot, D. Parkin, L. Punch, L. Rahn, S. Rossetti, S. Schilling, J. Schlittenhart, K. Schmidt, B. Shanley-Savage, S. Smith, L. Vickers, M. Vines, M. Vulcan, S. Weeks.

UNDERGRADUATE PROGRAMS

The Washington State University College of Nursing was established in 1968. Since its inception, the College has delivered excellent academic programs, engaged in research and service, and maintained strong partnerships with educational institutions and community healthcare organizations. The College functions as an integrated multi-campus system. Working across campuses, educational, research, and service initiatives strengthen the assets of each campus as well as the College as a whole.

The College of Nursing offers two baccalaureate programs. The pre-licensure undergraduate program is open to students beginning a nursing career. Students in this program complete approximately four academic years of full-time study. The post-licensure undergraduate program is open to registered nurses who completed an Associate Degree in nursing and who wish to obtain a baccalaureate degree in nursing. Students in this program complete approximately one year of full time study.

The program of study for both types of students leads to the degree of Bachelor of Science in Nursing (BSN). Undergraduate nursing programs at WSU are approved by the Washington State Nursing Care Quality Assurance Commission and nationally accredited by the Commission on Collegiate Nursing Education.

Pre-licensure BSN Students

Students with no previous preparation in nursing (pre-licensure BSN students) may complete pre-nursing course work (freshman and sophomore years) at Washington State University (Pullman or Tri-Cities campus locations), Eastern Washington University, Whitworth University, or another college or university. Pre-nursing coursework provides the student with a foundation in the natural and social sciences and the humanities. To apply for admission to the college, students must have at least 60 semester hours and all courses prerequisite to nursing completed the term prior to enrollment in the upper division.

The 300-400-level courses in the nursing major (junior and senior years) are offered at the College of Nursing in Spokane, Tri-Cities, and Yakima. These courses provide professional preparation in nursing, balancing course work with supervised clinical practice experiences in hospitals, healthcare organizations, and community settings. Upon successful completion of the pre-licensure BSN program, graduates are eligible to take the National Council Licensure Examination (NCLEX®) to become eligible for licensure as Registered Nurses.

Post-Licensure, RN-to-BSN Students

Students who are Registered Nurses (RN-to-BSN students) may apply to the RN-to-BSN program at any time following the completion of their basic Registered Nursing education. The RN-BSN is offered at all of the WSU campuses. The program builds on the RN background and includes essential course work in assessment, research, leadership and management, ethics, and community health. Advanced practicum experiences bridge course work and theory with clinical practice. The program is flexible, offering hybrid course delivery. A current, unencumbered Washington State RN License or eligibility for licensure is required. Applicants must be at junior standing (60 semester hours/90

quarter hours), have completed College of Nursing prerequisite courses and WSU's University Common Requirements (UCORE) or equivalent course work. Some Associate of Arts (AA), Associate of Science (AS), or Bachelor's degrees may satisfy these requirements. To apply for admission, consultation with a nursing academic advisor is required.

Transfer Students

All students who plan to transfer to nursing at Washington State University from other institutions should discuss their plans early with their academic advisor so that the pre-transfer program of study will be appropriate to nursing degree requirements. The College of Nursing offers pre-enrollment advising at campus locations in Spokane, Tri-Cities, Vancouver, and Yakima, as well as auxiliary sites in Longview and Walla Walla for Registered Nurses who plan to obtain the BSN from Washington State University.

Student Learning Outcomes

We expect our graduating students will be able to demonstrate competence in the provision of care, develop and apply professional values, and serve in the role of the Registered Nurse, and develop as designers, managers, and coordinators of care.

Student learning outcomes for our BSN Programs are: 1. Formulate nursing practice decisions using the foundation of a liberal education and evolving knowledge from nursing science, the biological and behavioral sciences, and the humanities. 2. Apply leadership concepts, skills, and decision-making in the provision of high quality nursing care, healthcare team coordination, and the oversight and accountability for safe care delivery in a variety of settings. 3. Integrate reliable evidence from multiple credible sources of knowledge including basic and health sciences to inform practice and make clinical judgments. 4. Demonstrate skills in using patient care technologies, information systems, and communication devices that support safety and quality nursing practice. 5. Demonstrate basic understanding of the role of nurses in advocating for patients, communities and populations in discussions related to healthcare policy, finance, and regulations. 6. Use inter-and intra-professional communication and collaborative skills to advocate for safe, evidence-based, high quality patient-centered care. 7. Demonstrate basic understanding of the role of health promotion, and disease/injury prevention in improving population health across the lifespan. 8. Demonstrate the values central to nursing practice including: altruism, autonomy, human dignity, integrity, advocacy, social justice and life-long learning. 9. Provide safe, competent, compassionate, ethical, culturally sensitive, and evidence based nursing care to individuals, families, groups, communities and populations through promotion, maintenance and restoration of health; prevention of illness, and physical, emotional, and spiritual support throughout the life span including end of life, and across the continuum of health care environments.

MASTER OF NURSING PROGRAM

The master's programs in nursing at the College of Nursing were established in 1983 and have been continuously accredited by the Commission on Collegiate Nursing Education. The programs build on an undergraduate baccalaureate degree and provide graduates with a foundation for further study at the doctoral level. Students may be admitted

to the post-baccalaureate Master's in Nursing program after completing a bachelor's degree in nursing or may enroll in the RN-to-Master's in Nursing program after earning an Associate Degree in Nursing (ADN) and a bachelor's degree in a field related to nursing. Completion of a thesis or clinical project is required.

Most students will complete the Master's program in two academic years. Provision is made for part-time matriculation over a longer period of time, subject to policies and requirements of Washington State University and the College of Nursing. Students graduate with a specialty in Population Health, Nursing Leadership, or Nursing Education. Post-Master's certificates are available in Nursing Leadership or Nursing Education.

Students apply to the Graduate School in Pullman, WA. The Graduate Program Office in the College of Nursing provides information to prospective students and support for current students, including assignment of faculty advisors and support for enrollment and progression. International applicants also must meet general Graduate School international applicant requirements. Please see <http://gradschool.wsu.edu/international-requirements/>.

Student Learning Outcomes

Student Learning Outcomes that we expect our graduating students to meet are 1) integrate scientific findings from nursing, biopsychosocial fields, genetics, public health, quality improvement, and organizational sciences for the continual improvement of nursing care across diverse settings; 2) implement organizational and system leadership skills to promote high quality, safe patient care that emphasizes ethical and critical decision making and effective working relationships within a systems perspective; 3) articulate multiple elements of quality, including methods, tools, performance measures, and quality standards, and apply these within an organization; 4) apply research outcomes within the practice setting to resolve practice problems, and work as a change agent to disseminate these results; 5) use patient-care technologies to deliver and enhance care, including communications technologies to integrate and coordinate care; 6) intervene at the systems level through policy development, and employ advocacy strategies to influence health and health care; 7) communicate, collaborate, and consult with other health care professionals as a member or leader of inter-professional teams to manage and coordinate care; 8) apply and integrate broad organizational, client-centered culturally appropriate concepts when planning, delivering, managing, and evaluating evidence for clinical prevention and population care, including services to individuals, families, and aggregates/identified populations; and 9) articulate a broadly defined understanding of nursing practice as any form of nursing intervention that influences health care at the direct and indirect care levels for individuals, populations, and systems, coupled with an advanced level of understanding of nursing and relevant sciences that is integrated into direct and indirect nursing practice.

DOCTOR OF NURSING PRACTICE (DNP) PROGRAM

The Doctor of Nursing Practice (DNP) program, like other graduate programs offered by the College of Nursing, is open to students seeking advanced

education in nursing. The DNP program prepares nurses to be leaders in clinical practice and allows graduates to practice at the most advanced level of nursing. The DNP program provides students with opportunities to work in various health care settings under the guidance of experienced faculty mentors and community experts. An integral part of the program is the completion of the Doctor of Nursing Practice (DNP) Project, which provides students with the knowledge and skills to utilize research and leadership in practice and to participate in research relevant to their practice. DNP graduates are prepared to translate research and evidence into practice, lead interdisciplinary care teams, measure health-related outcomes, and improve the health of individual patients, groups, populations, and communities.

Prospective students who have earned the Bachelor of Science in Nursing degree select one of three areas of emphasis in the DNP Program: DNP Family Nurse Practitioner (FNP), DNP Psychiatric Mental Health Nurse Practitioner (PMHNP), or DNP Population Health (APH). Along with completing required didactic coursework, students will complete a minimum of 1,000 practicum hours. Graduates of the FNP and PMHNP programs are eligible to complete a national certification examination leading to state licensure as Advanced Registered Nurse Practitioners.

Prospective students who have earned the Master's degree in Nursing complete an individualized program of study that includes a minimum of 32 credits and requires the completion of a minimum of 1,000 post-baccalaureate practicum hours.

The DNP program is open to students who hold a Bachelor of Science in Nursing degree or a bachelor's degree in a related field and a Master's degree in Nursing from an accredited program. Admission is granted on the basis of the student's 1) undergraduate and, if applicable, graduate GPA; 2) licensure as a registered nurse in Washington state (or, for international students, eligibility for licensure on admission with completion of process before first clinical/practicum course enrollment); 3) recommendations relative to professional nursing competence and prediction of success as a graduate student; and 4) written goal statement congruent with program's philosophy and focus. A written and/or verbal interview is required for all applicants. International applicants also must meet general Graduate School international applicant requirements. Please see <http://gradschool.wsu.edu/international-requirements/>.

DNP students may have the option to earn a Master of Nursing (MN) thesis or non-thesis degree while enrolled in the Doctor of Nursing Practice program. To do this, students must maintain their DNP student status while completing all requirements for this MN degree including the completion of a thesis or clinical project. To earn this degree, students must:

- Work closely with an academic advisor to establish a program of study.
- Review all requirements for the MN degree.
- Select a chair and committee for the Master's thesis or clinical project.
- Be familiar with all Graduate School requirements regarding completion of the thesis or project.
- Maintain status as a student in good standing, maintain a minimum 3.0 GPA in all graduate courses.

- Complete an Add an Academic Program Form, available on the Graduate School website, and submit the form to the Graduate Program Office.

- Complete the program of study for the master's degree and submit it to the Graduate Program Office.

Students apply to the Graduate School in Pullman, WA. The Graduate Program Office in the College of Nursing provides program information to prospective students and support for current students, including assignment of faculty advisors and support for enrollment and progression.

Student Learning Outcomes

We expect that DNP graduates: 1) develop, evaluate, and apply scientific theories of health, illness, and human behavior to strategies and interventions; 2) lead in the vision, development, implementation, and evaluation of care delivery approaches that ensure ethical stewardship, accountability, quality, and patient safety; 3) translate evidence-based research into practice; 4) integrate, evaluate, and apply new knowledge and technology in advanced practice, administration, and education; 5) serve as a leader in the development, implementation, and evaluation of health care policy to advance the nursing profession and to advocate for social justice, equity, and ethical policies in all aspects of health care; 6) provide leadership in collaborative efforts among health professionals and with clients and community partners; 7) analyze and translate scientific information related to the health of diverse populations to reduce health disparities in urban, rural, and global settings and to transform care delivery systems to prevent illness and optimize health; 8) apply advanced clinical judgment and accountability in the design, delivery, and evaluation of evidence based care to individuals, families, and populations; and 9) demonstrate mastery of professional competencies leading to certification within a practice specialty.

PHD IN NURSING PROGRAM

The PhD in Nursing Program began in summer 2007 and admits up to 10 students each summer. The program prepares students to advance the discipline of nursing science through a research-focused program emphasizing innovative approaches and leveraged resources to improve health care. Graduates are equipped to become leaders in nursing education and research, critical roles in today's health care environment.

Students complete required coursework over 7 semesters using a combination of instructional approaches including face-to-face meetings on the WSU-Spokane campus, live interactive video conferencing, and online learning. All students prepare a dissertation research proposal to meet requirements for the preliminary examination, and complete an independent research study.

The baccalaureate to PhD program, approved by the College of Nursing and WSU Graduate School, began in Fall Semester, 2015. The program includes a "bridge year" consisting of two semesters of preparatory (Master's level) coursework before beginning the traditional PhD program with the next incoming summer cohort. The required 85 credits can be completed in 9 semesters of study by most students who are attending full-time. Students are selected for the RN-to-PhD program based on the same competitive criteria used for all applicants.

However, baccalaureate students will be followed by a program director or designee as they begin the bridge year to help them identify potential advisors and refine research interests early. Please see <http://gradschoolwsu.edu/international-requirements/>.

Students apply to the Graduate School in Pullman. Program information, determination of student interests and goals, and assignment of a faculty advisor are provided by the Ph.D. Program office at the College of Nursing. Priority application deadline for summer admission is October 15, though applications may be taken until April of the starting summer. Applications to the baccalaureate to PhD program will be taken on a rolling basis, with a typical start date of Fall semester.

Student Learning Outcomes

We expect graduates of the PhD in Nursing program to: 1) contribute to advancing nursing science and practice through clinical research; 2) analyze, construct, and test theoretical frameworks that guide nursing research design, methodology, data analyses, and the transfer of new knowledge into practice; 3) create effective interdisciplinary collaborations to foster research and the transfer of evidence-based knowledge into best clinical practices; 4) synthesize knowledge from a variety of disciplines to create research designs and methods for nursing science and to address ethical, social, cultural, political, and professional issues; 5) implement proven and emerging technologies to enhance nursing research and education; and 6) implement innovative research designs, methodologies, leadership skills, health education, and/or life style modification techniques to address the health care needs of vulnerable populations and disparities in the access to or delivery of health care.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

NURSING (121 HOURS)

A grade of C or better is required in all prerequisite courses and nursing courses.

Criteria for admission to the 300-400-level nursing major include an overall cumulative GPA of 3.00 or higher and a cumulative GPA of 3.00 or higher in prerequisite courses. Achievement at a "proficient" level or above on the Test of Essential Academic Skills (TEAS) is required for all Pre-licensure applicants. Responses to personal interview questions may be used as additional admission criteria. All pre-licensure applicants are required to have at least 50 hours of volunteer/work health experience and provide a proctored writing sample at interview time.

Part-time schedule of study is available; see advisor.

First Year

First Term	Hours
CHEM 101 [PSCI]	4
Creative & Professional Arts [ARTS]	3

Diversity [DIVR] 3
HISTORY 105 [ROOT] 3

Second Term Hours
BIOLOGY 102 [BSCI], 106 [BSCI], or
107 [BSCI] 4
CHEM 102 4
ENGLISH 101 [WRTG] 3
PSYCH 105 [SSCI] 3
SOC 101 or 102 3

Second Year

First Term Hours
BIOLOGY 251 4
Humanities [HUM] 3
MBIOS 101 4
STAT 212 [QUAN] 4

Second Term Hours
BIOLOGY 140 or 333 3
BIOLOGY 315 4
Communication [COMM] or Written
Communication [WRTG] 3
H D 101 3
Complete Writing Portfolio

Third Year

First Term Hours
NURS 308 3
NURS 311 4
NURS 315 4
NURS 316 2
NURS 317 3
NURS 328 2

Second Term Hours
NURS 309 [M] 3
NURS 322 2
NURS 323 2
NURS 324 4
NURS 325 5

Fourth Year

First Term Hours
NURS 408 3
NURS 412 1
NURS 414 3
NURS 415 2
NURS 416 3
NURS 417 2

Second Term Hours
NURS 409 2
NURS 424 3
NURS 425 2
NURS 426 [M] 2
NURS 427 3
NURS 430 [CAPS] 3

NURSING - REGISTERED NURSES OPTION

Bachelor of Science Option for Registered Nurses:
Required courses: NURS 360, 365, 366, 400, 405,
406, 440, 462, 465, 477, 495, Integrated Capstone/
upper-division elective.

Description of Courses

NURSING

NURS

308 Professional Development I: Evidence Based Practice 3 Course

Prerequisite: Certified major in Nursing. First of professional development series; focus on nursing and health care research, information management, informatics, and development of nursing research.

309 [M] Professional Development II: Ethical Reasoning and Decision Making Processes in Nursing 3 Course

Prerequisite: NURS 308; NURS 315 or concurrent enrollment. Continuation of professional development series; moral/ethical reasoning models, decision processes, and philosophical basis of nursing as a discipline.

311 Pathophysiology and Pharmacology in Nursing 4 Course

Prerequisite: Certified major in Nursing. Etiology, pathogenesis, clinical manifestations of common human dysfunction; nursing implications for prevention and therapeutic approaches including pharmacologic and non-pharmacologic therapies.

315 Nursing Practice: Health and Illness 4 (0-12) Course

Prerequisite: Certified major in Nursing. Introduction to nursing practice and health assessment: professional values, core competencies, core knowledge and role development. S, F grading.

316 Introduction to Nursing Practice in Health and Illness: Theory 2 Course

Prerequisite: Certified major in Nursing. Introduction to nursing concepts and holistic assessment including core professional values, knowledge and competencies for nursing practice.

317 Health Assessment 3 (2-2) Course

Prerequisite: Certified major in Nursing. Systematic approach to health assessment of adults emphasizing and incorporating use of nursing process and scientific rationale.

318 Growth and Development Across the Life Span 3 Course

Prerequisite: Certified major in Nursing. Theoretical and conceptual perspectives on human growth and development across the life span.

322 The Human Experience of Diversity and Health 2 Course

Prerequisite: Certified major in Nursing. Explorations of regional, national, and global expressions of health and illness and implications for health care professionals.

323 Nursing in the Genome Era 2 Course

Prerequisite: Certified major in Nursing. Science and application of genetic and genomic concepts to nursing care.

324 Nursing Concepts in Acute and Chronic Illness in the Adult 4 Course

Prerequisite: NURS 311; NURS 315; NURS 316; NURS 317. Theoretical concepts of acute and chronic illness in the adult as a basis for critical thinking and decision-making in nursing.

325 Nursing Practice in Acute and Chronic Illness in Adults 5 (0-15) Course

Prerequisite: NURS 311; NURS 315; NURS 316; NURS 317; concurrent enrollment in NURS 324. Application of acute/chronic illness concepts in adults as a basis for critical thinking and decision-making in nursing. S, F grading.

328 Introduction to Gerontological Nursing 2 Course

Prerequisite: Certified major in Nursing. Professional values, communication, and functional assessment in care of elders; core knowledge and role development of the gerontological nurse.

360 Professional Nursing Concepts and Issues 2 Course

Prerequisite: Certified major in Nursing. Philosophical, historical, economic, legal/ethical, and professional issues designed for registered nurses to build upon previously acquired professional concepts.

365 Nursing Concepts: Assessment and Application of Physiological Concepts to Nursing Practice I 2 Course

Prerequisite: Certified major in Nursing. Integration of pathophysiological, assessment, pharmacological nursing concepts with diverse client populations; emphasizing neurological, EENT, skin, musculoskeletal, endocrine, and respiratory systems.

366 Nursing Concepts: Assessment and Application of Physiological Concepts to Nursing Practice II 2 Course

Prerequisite: Certified major in Nursing. Integration of pathophysiological, assessment, pharmacological nursing concepts with diverse client populations; emphasizing fluid/electrolytes, oncology, GI/GU; cardiovascular; immune system, renal.

392 Therapeutic Touch: A Nursing Modality of Caring and Healing 3 (2-3) Course

Prerequisite: Certified major in Nursing. Explores the broad arena of touch as a means of interpersonal communication and as a mechanism for healing using Krieger-Kunz method.

398 Special Topics V 1-3 May be repeated for credit; cumulative maximum 6 hours.

399 RN-BSN EXAM 32 S,F Grading. S, F grading.

400 [M] Nursing Research, Evidence-Based Practice, and Informatics 3 Course

Prerequisite: Certified major in Nursing. Application of informatics skills and research processes to evidence-based clinical practice.

405 Nursing Leadership 2 Course

Prerequisite: Certified major in Nursing. Application of group leadership and management theories to professional nursing practice.

406 Nursing Management 3 Course

Prerequisite: Certified major in Nursing. Management, leadership, and group theories are utilized and applied to the management of nursing and health care.

408 Professional Development III: Leadership and Management 3 Course

Prerequisite: NURS 309. Continuation of professional development series; focus on impact of leadership, management, and resource allocation on patient outcomes.

- 409 Professional Development IV: Transition to Practice 2** Course Prerequisite: NURS 408; NURS 414; NURS 415; NURS 416; NURS 417. Continuation of professional development series; focus on transition to practice and nursing across health care systems/delivery within global arena.
- 412 Family and Community as a Context of Care 1 (0-2)** Concepts of family-focused nursing assessment, planning, and interventions with emphasis on referral to appropriate community resources.
- 414 Child and Family Health: Theory 3** Course Prerequisite: NURS 324; NURS 325; concurrent enrollment in NURS 328. Analysis and evaluation of scientific and theory base for nursing care of children and families.
- 415 Children and Families as the Focus of Nursing Care 2 (0-6)** Course Prerequisite: NURS 324; NURS 325. Synthesis and application of underlying science and nursing process with the unique population of children and families. S, F grading.
- 416 Childbearing Health of the Family 3** Course Prerequisite: NURS 324; NURS 325; concurrent enrollment in NURS 328. Care of childbearing families within the context of community; newborn health, and men's and women's reproductive health addressed.
- 417 Nursing Care of Childbearing Families 2 (0-6)** Course Prerequisite: NURS 324; NURS 325. Nursing care of families during the childbearing continuum and/or acute care settings; combination of clinical and seminar. S, F grading.
- 424 Psychiatric/Mental Health Nursing Concepts 3** Course Prerequisite: NURS 414; NURS 415; NURS 416; NURS 417. Healthy to psychopathological states studied within a nursing framework; includes history, theories, legal/ethical issues of psychiatric/mental health nursing.
- 425 Nursing Practice: Psychiatric/Mental Health 2 (0-6)** Course Prerequisite: NURS 414; NURS 415; NURS 416; NURS 417; concurrent enrollment in NURS 424. Clinical application of the nursing process with clients experiencing acute and chronic psychiatric/mental health disruptions. S, F grading.
- 426 [M] Community Health Nursing Theory 2** Course Prerequisite: NURS 414; NURS 415; NURS 416; NURS 417. Synthesis of nursing and public health concepts with emphasis on community as partner and population-focused practice.
- 427 Community Health Nursing Practice 3 (0-9)** Course Prerequisite: NURS 414; NURS 415; NURS 416; NURS 417; concurrent enrollment in NURS 426. Promoting the public's health through application of the public health functions; assessment, policy development, and assurance. S, F grading.
- 430 [CAPS] Senior Practicum 3 (0-9)** Course Prerequisite: NURS 409 or concurrent enrollment; NURS 424 or concurrent enrollment; NURS 425 or concurrent enrollment; NURS 426 or concurrent enrollment; NURS 427 or concurrent enrollment. Clinical and theoretical concepts applied in a concentrated clinical practicum; use of clinical preceptors and student objectives. S, F grading.
- 440 [M] Population Health Theory 3** Course Prerequisite: Certified major in Nursing. Synthesizes population-based nursing and public health concepts with a focus on upstream interventions in partnership with the community.
- 455 Cultural Safety and Social Justice in Global Society 3** Balance of power in health professional relationships, cultural safety, social justice, and diversity in global society.
- 456 Narrative Health Care in Clinical Practice 3** Narrative processes of attention, representation, and affiliation experienced by health professional students in clinical encounters.
- 462 Selected Nursing Concepts: Psychiatric/Mental Health 2** Nursing process with individuals and families experiencing psychiatric/mental health disruptions.
- 465 Nursing Practice: Community and Psychiatric Mental Health 3 (0-9)** Course Prerequisite: NURS 462 or concurrent enrollment; NURS 440 or concurrent enrollment. Application of community health, public health, and psychiatric/mental health nursing concepts to individuals, families, and communities with identified health needs.
- 476 Health Law: Application to Practice 3** Course Prerequisite: Junior standing. Laws, principles and issues related to regulations of health care professionals, practice settings and public and private programs.
- 477 Health Care Ethics V 2-3** Ethical theories including deontology, teleology, virtue ethics and applicability to ethical dilemmas in nursing. Credit not granted for both NURS 477 and NURS 577.
- 478 Plateau Tribes: Culture and Health 3 (2-3)** Course Prerequisite: Certified major in Nursing, Nutrition and Exercise Physiology, or Pharmacy; Junior standing. History, culture, and health care needs of the Plateau Indian tribes; both classroom and practicum experience. Credit not granted for both NURS 478 and NURS 578.
- 479 Advanced Physiology for Clinical Practice 3** Course Prerequisite: Certified major in Nursing. Cellular and system physiology foundational to advanced practice and understanding drug mechanisms of action.
- 481 International Health Care 3** Course Prerequisite: NURS 315. Study abroad experience in global health care; assessment and evaluation skills in planning and implementing culturally appropriate health care for individuals and communities.
- 490 Basic Dysrhythmia Interpretation/Advanced Cardiac Life Support V 1-3** May be repeated for credit; cumulative maximum 6 hours. Basic interpretation of common ECG rhythms, dysrhythmias, and application of ACLS dysrhythmia management guidelines.
- 491 Advanced Cardiac Life Support (ACLS) and Laboratory Value Analysis and Interpretation 3** Course Prerequisite: NURS 311; NURS 324; NURS 325. Analysis/interpretation of common laboratory values; basic interpretation of common ECG rhythms, dysrhythmias, and application of ACLS dysrhythmias management guidelines.
- 492 Essentials of Disaster Management for Health Professions 3** Course Prerequisite: Certified major in Nursing; junior standing. Implications for disaster management across the health professions; mental health and ethical issues and concerns related to vulnerable populations.
- 495 [CAPS] Nursing Practice: Advanced Clinical Practicum 3** Course Prerequisite: Certified major in Nursing. Application and integration of theoretical content in an area of nursing practice of special interest to the student.
- 497 Special Topics in Nursing V 1-3** May be repeated for credit; cumulative maximum 6 hours.
- 498 Special Topics in Nursing V 1-3** May be repeated for credit; cumulative maximum 6 hours.
- 499 Special Problems V 1-4** May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 501 Psychiatric Assessment, Diagnosis, and Management of Children and Adolescents 3** Introduction to assessment, diagnosis, and management of psychiatric illnesses common in children and adolescents.
- 502 Psychiatric Assessment, Diagnosis, and Management of Adults and Geriatrics 3** Course Prerequisite: NURS 501; NURS 555; concurrent enrollment in NURS 560. Introduction to assessment, diagnosis, and management of psychiatric illnesses common in adults and geriatrics.
- 503 Scientific Inquiry in Nursing 2** Course prerequisite: Graduate standing in Nursing. Scientific inquiry applied to theoretical and philosophical foundations in nursing.
- 504 Evidence-Based Practice 3** Course prerequisite: NURS 503 or concurrent enrollment, or in graduate Nursing Certificate program. Exploration of evidence-based practice through the conduct of scientific inquiry and application of credible evidence.
- 505 Analytical Foundations for Practice Inquiry 3** Application of quantitative methods and statistics in current health care to review, describe, and interpret the language of research.

- 507 Health Care Policy Analysis V 2-3** Analysis of health care system policy; exploration of issues of clinical management and community resource utilization including advocacy techniques.
- 508 Diagnostics and Procedures for Primary Care Practice 2 (1-4)** Course Prerequisite: NURS 562; NURS 563; NURS 581. Introduction to the selection and interpretation of diagnostic tests, and performance of minor procedures for primary care practice.
- 509 Primary Care of Common Acute Conditions 3** Course Prerequisite: NURS 562; NURS 563; NURS 581. Primary care framework for conducting systematic clinical encounters, developing differential diagnoses, and planning care for individuals and families.
- 511 Advanced Nursing Practice Competencies for Population Health 2** Course Prerequisite: NURS 539. Advanced nursing and interprofessional practice competencies necessary to reduce health disparities and improve health outcomes for individuals, families, communities, populations.
- 512 Practicum in Interprofessional Collaboration 2** Course prerequisite: NURS 511 or concurrent enrollment. Synthesis and application of advanced nursing and interprofessional competencies to improve health outcomes and reduce health disparities.
- 513 Primary Care I: Health Promotion, Disease Prevention, and Disease Detection 3** Course Prerequisite: NURS 508; NURS 509. Primary care approaches to health promotion, disease prevention, risk reduction, and disease detection for individuals and families across the life span.
- 514 Primary Care Practicum 1 2 (0-8)** Course Prerequisite: NURS 508; NURS 509. Primary care practicum experience focused on health promotion, disease prevention, and disease detection across the lifespan in primary health care.
- 515 Primary Care II: Acute Health Conditions 3** Primary care approaches to the assessment, diagnosis, and management of individuals and families across the lifespan with common acute conditions.
- 516 Primary Care Practicum II 2 (0-8)** Primary care clinical practicum that focuses on caring for individuals and families across the lifespan with common, acute health conditions.
- 517 Quality Improvement and Program Evaluation 3** Principal dimensions of healthcare quality management including quality measurement and continuous quality improvement.
- 518 Translating Evidence into Practice 3** Course prerequisite: Graduate standing in Nursing. Health related evidence and development of skills to apply evidence in advanced practice.
- 519 Teaching in the Information Age 3** Course Prerequisite: By instructor permission. Focus on educational paradigms consistent with distance education; development of a variety of multimedia materials for nursing education. Required preparation: Basic computer skills.
- 520 Nursing Education in a Multicultural Society V 3 (0-9) to 5 (0-15)** Course Prerequisite: By instructor permission. Application of learning theories and strategies useful in teaching diverse populations; taught in a distance degree format.
- 521 Teaching, Learning and Evaluation in Nursing 3** Exploration of concepts related to teaching-learning, assessment of diverse learning needs, instructional strategies and design, evaluation of performance outcomes.
- 523 Educational Issues and Curriculum Analysis 3** Exploration of curriculum history, development, future predictions; program evaluation, instructional resources, leadership, and policy development in academic and service settings.
- 524 Foundations of Methodological Applications for Health Sciences 2** Qualitative and quantitative methods in health care; research, statistics, and interpretation language.
- 525 Psychopharmacology and Critical Issues in Safe Prescribing 3** Psychopharmacology across the lifespan for clinical practice including pharmacokinetics, pharmacodynamics, principles of prescribing, client education and outcome monitoring.
- 526 Analytical Foundations for Health Sciences 3** Quantitative methods, research and statistics in current health care literature. Required preparation must include college-level statistics course.
- 527 Association, Group Difference and Regression Techniques for Health Services 3** Course Prerequisite: NURS 526. Application of quantitative techniques to explore relationships and group differences among variables supporting questions in health science research. Required preparation: Graduate-level statistics course.
- 528 Multivariate Statistical Techniques for Health Sciences 3** Course Prerequisite: NURS 527. Application of quantitative techniques to explore multivariate relationships among variables supporting questions in health science research.
- 529 Analytical Seminar for Health Science 3** In-depth research methods used for health science research.
- 530 Theory of Psychopharmacology and Safe Prescribing Practices 3** Course Prerequisite: NURS 532; NURS 563; NURS 581. Theoretical perspectives of psychopharmacology as they pertain to safe prescribing and monitoring patient outcomes in psychiatry.
- 531 Culture, Populations, and Family Health Care 3** Diverse health beliefs and practices of clients, families, and members of the interdisciplinary health care team.
- 532 Resource Stewardship in Health Care 3** Theory, research and practice dimensions of resource stewardship to effectively manage human and material resources in the practice setting.
- 533 Trends and Issues in Healthcare Education: Workforce Diversity and Delivery Methods 3** Synthesis and application of advanced adult education theory, competencies, instructional delivery technologies, and best practices in interprofessional healthcare education.
- 534 Research Seminar: Grant Development and Critique 3** Seminar focusing on writing a fellowship and/ or grant application and skills for critically reviewing a funded fellowship or grant.
- 535 Philosophy of Nursing Science 3** Course prerequisite: Graduate standing in Nursing; NURS 534 or concurrent enrollment. Structure and organization of fields of knowledge in science including historical and philosophical tenets of inquiry.
- 536 Nursing Theory: Foundations for Knowledge Development 3** Course prerequisite: Graduate standing in Nursing. Theory development analysis; theory critique; nursing knowledge examination; impact of theory on nursing science, applied to student's phenomenon of interest.
- 537 Primary Care III: Chronic and Complex Health Conditions 3** Course Prerequisite: NURS 515; NURS 516. Synthesis of clinical management approaches for care of individuals with chronic and complex conditions across the lifespan and their families.
- 538 Primary Care Practicum III 2 (0-8)** Course Prerequisite: NURS 515; NURS 516. Primary care practicum focused on caring for individuals and families with complex and chronic health conditions across the lifespan.
- 539 Scientific Foundations of the Advanced Practice Nursing Role 2** Course prerequisite: Graduate standing in Nursing. Analysis of the foundations of the Advanced Practice Nursing role emphasizing the integration of practice inquiry and advanced practice.
- 540 Internship: Practicum in Advancing the FNP Primary Care Role V 1-10** May be repeated for credit; cumulative maximum 10 hours. Course Prerequisite: NURS 567; NURS 570. Primary Care Practicum experience requiring the supervised provision of increasingly complex direct patient care.
- 541 Psychiatric/Mental Health Nursing: Individuals 4 (3-3)** Course prerequisite: Graduate standing in Nursing; NURS 562; NURS 581 or concurrent enrollment. Theories of psychopathology and appropriate nursing interventions with individuals across the age continuum.
- 542 Population Focused Clinical Foundations for Healthcare Educators 3** Synthesis and application of population health perspectives and educational and instructional best practices in teaching courses foundational to clinical practice.
- 543 Psychiatric Mental Health Nursing 4 (3-3)** Course prerequisite: NURS 541; NURS 581. Introduction to theory and practice of group psychotherapy; Milieu and other selected theories studied and applied to nursing practice.

- 544 Therapeutic Modalities I: Introduction to Therapies** 3 Initial theoretical training in individual and group therapy applicable across lifespan and cross-culturally.
- 545 Therapeutic Modalities II: Specialization in Therapy** 3 Course Prerequisite: NURS 544; concurrent enrollment in NURS 547. Focused training in theory of individual and group therapies applicable across lifespan and cross-culturally.
- 546 Practicum in Psychiatric/Mental Health Nursing** V 4 (1-9) to 5 (1-12) Course prerequisite: Graduate standing in Nursing; NURS 525; NURS 541; NURS 543; NURS 562; NURS 581. Individualized clinical experience/ seminar designed to provide advanced competency, accountability, leadership in psychiatric/mental health nursing.
- 547 Introduction to Practice: Therapeutic Modalities** 3 Course Prerequisite: NURS 544; concurrent enrollment in NURS 545. PMHNP practicum experience emphasizes the development of the advanced practitioner role in developing therapeutic relationships with clients across the lifespan.
- 548 Psychiatric Mental Health Nurse Practitioner Internship** 4 May be repeated for credit; cumulative maximum 8 hours. Course prerequisite: NURS 525; NURS 546. Clinical experience providing advanced psychiatric mental health nursing care to individuals and families across the lifespan.
- 549 Addiction Perspectives** 2 Overview of the theories, physiology, course and epidemiology of addictions; assessment, evaluation, prevention and treatment.
- 550 International, Interdisciplinary, and Transcultural Health Care** 3 Diverse health beliefs and practices or clients and members of the interdisciplinary health care team.
- 551 Risk and Resilience in Child and Adolescent Health** 4 Risk and resilience models in the development of strengths-based health interventions for child and adolescent populations.
- 552 Family Nursing in the Community** V 2-4 Theoretical approaches to the analysis of normal and at-risk families; application of family assessment and intervention models when planning care.
- 553 Practicum in Organizational Systems and Leadership** 3 (1-6) Course Prerequisite: NURS 576 or concurrent enrollment. Integration of principal dimensions of healthcare quality improvement and measurement of nurse leaders in a constantly changing health care environment.
- 554 Epidemiology and Biostatistics for Health Professions** 3 Course Prerequisite: NURS 526 or graduate level statistics course. Introduction to epidemiology: principles and methods of epidemiologic investigation including analysis of key elements of investigation of high risk populations. Required preparation must include college-level statistics course.
- 555 PMHNP Practicum I** 3 (1-8) Psychiatric mental health practicum experience focused on developing initial competence in assessment, interview, diagnosis, and development of evidence-based approaches to treatment.
- 556 Advanced Population Health** V 2-6 Course Prerequisite: Graduate student in Nursing; instructor permission. Culminating analysis, development, and enactment of advanced practice roles in teaching, practice, or administration of community-based/ population-focused nursing.
- 557 Concepts of Practice Transformation** 3 (2-3) Application of knowledge of current nursing science to the development of a proposal for the final DNP project.
- 558 Practice Transformation Project I: Program Design and Data Collection** 3 (1-6) Course Prerequisite: NURS 557 with a grade B or better. Development of program design plan and collection of data for the DNP Practice Transformation Project.
- 559 Practice Transformation Project II: Implementation, Evaluation, and Dissemination** 3 (1-6) Course Prerequisite: NURS 557 with a grade B or better; NURS 558 with a grade B or better. Implementation and evaluation of the DNP Practice Transformation Project.
- 560 PMHNP Practicum II** 3 (0-12) Course Prerequisite: NURS 501; NURS 555. Psychiatric mental health practicum experience focused on developing increased competence in assessment, diagnosis, and evidence-based treatment planning across the lifespan.
- 561 Advanced Assessment and Diagnosis for the Psychiatric Mental Health Practitioner** 3 Course prerequisite: Graduate standing in Nursing. Assessment and diagnosis of psychiatric illnesses across the lifespan; focus on physical and psychiatric history, examinations, and psychometric evaluation.
- 562 Advanced Health Assessment and Differential Diagnoses** 3 (2-3) Course prerequisite: Graduate standing in Nursing. Applying health assessment and differential diagnostic skills to individuals, families, and populations in rural, urban, and medically under-served areas.
- 563 Advanced Pharmacological Concepts and Practice** 3 Pharmacology for clinical practice including decision making, prescribing, drug monitoring, and patient education associated with prescriptive authority.
- 564 Health Promotion in Nursing Practice** 2 Interprofessional course analyzing the theoretical bases for developing and evaluating health promotion strategies tailored to variations in health behaviors.
- 565 Information Management for Clinical Practice** 3 Application/evaluation of nursing informatics; information systems to support clinical research, practice, administration, and education. Required preparation must include competency in word processing/spreadsheets.
- 566 Community Analysis and and Grant Development** 2 Application of core public health functions in community analysis, program development and program evaluation.
- 567 Primary Care of Families: Adults and Elders** 4 (1-9) Course prerequisite: Admission to FNP program; NURS 562; NURS 563; NURS 581. Assessment, differential diagnosis, therapeutic intervention with adults; developmental changes; opportunities to provide diagnostic, maintenance, and follow-up care.
- 568 Primary Care of Families: Infants, Children and Adolescents** 4 (1-9) Course prerequisite: Admission to FNP program; NURS 562; NURS 563; NURS 581. Assessment, differential diagnosis, and therapeutic intervention with infants, children, and adolescents in rural and urban settings.
- 569 Primary Care of Families: Family 4** (1-9) Course prerequisite: Admission to FNP program; NURS 562; NURS 563; NURS 581. Assessment, differential diagnosis, therapeutic intervention with individuals in childbearing, childrearing, and multigenerational families.
- 570 Clinical Decision Making** 2 Course Prerequisite NURS 554; concurrent enrollment in NURS 567. Framework for developing differential diagnoses and treatment plans based on systematic collection, organization, analysis and communication of data.
- 573 Rational Prescribing** 3 Course Prerequisite: NURS 563; admission to FNP program. Pharmacology for clinical practice including decision-making, prescribing, drug monitoring, and patient education associated with prescriptive authority.
- 575 Diagnostic Testing and Interpretation** 3 (2-3) Course prerequisite: Admission to FNP program. Analysis of diagnostic findings across the age continuum for clinical decision making; selected diagnostic and treatment skills for advanced practice.
- 576 Organizational Systems and Leadership Roles in Nursing Practice** 3 Course prerequisite: Graduate standing in Nursing. Analysis of advanced nursing roles and required skill sets to develop competencies in organizational systems analysis and leadership.
- 577 Health Care Ethics** V 2-3 Ethical theories including deontology, teleology, virtue ethics and applicability to ethical dilemmas in nursing. Credit not granted for both NURS 477 and NURS 577.
- 578 Plateau Tribes: Culture and Health** 3 (2-3) Course Prerequisite: Graduate standing in Nursing, Nutrition and Exercise Physiology, or Pharmacy. History, culture, and health care needs of the Plateau Indian tribes; both classroom and practicum experience. Credit not granted for both NURS 478 and NURS 578.
- 580 Practicum in Advanced Nursing Practice** V 1 (0-3) to 5 (0-15) Course prerequisite: NURS 539; concurrent enrollment in NURS 576. Integration and synthesis of practice inquiry; leadership and advanced practice to demonstrate competency in an area of advanced practice nursing. S, F grading.

- 581 Advanced Pathophysiology 3** Etiology, pathogenesis, manifestations, and outcomes of disruption and dysfunction of human physiology.
- 582 PMHNP Internship 3** Course Prerequisite: NURS 501; NURS 502; NURS 530; NURS 544; NURS 545; NURS 547; NURS 555; NURS 560. A culminating internship focusing on the provision of comprehensive psychiatric mental health care to individuals and families across the lifespan.
- 583 Population Health Nursing Internship V 1-5** May be repeated for credit; cumulative maximum 10 hours. Course Prerequisite: Current enrollment in WSU Advanced Population Health Nursing Graduate Program (MN or DNP). Application and integration of theoretical content, research, assessment, and intervention strategies into practice.
- 584 Health Care Law, Policy, and Analysis 3** Analysis of health care policy and delivery systems including access, disparity, barriers to care, social justice, vulnerability, and health outcomes.
- 585 Faculty Role Seminar 3** Analysis of current issues related to the faculty role in nursing education.
- 587 Research Inquiry: Qualitative Methods I 3** Qualitative methodologies, issues and techniques of data collection, analysis and interpretation; issues of ethics and bias.
- 588 Research Inquiry: Quantitative Methods I 3** Quantitative methodologies, issues and techniques of data collection, analysis and interpretation.
- 589 Psychometrics in Health Care Research 2** Course prerequisite: NURS 526; NURS 527; 588. Application of psychometric theory and techniques for constructing, analyzing and testing instruments to measure nursing and educational interventions and outcomes.
- 590 Research Inquiry: Quantitative Methods II 2** Course prerequisite: NURS 588; NURS 589. Advanced theoretical and practical application of selected quantitative and methodological strategies.
- 591 Mixed Methods for Program Development, Implementation, and Evaluation 3** A mixed-methods approach to program development, implementation, and outcomes evaluation in healthcare.
- 592 Research Inquiry: Qualitative Methods II 2** Course prerequisite: NURS 587. Application of qualitative methodologies, techniques of qualitative data analysis, presentation of qualitative findings, rigor, data management and research dissemination.
- 593 Preliminary Examination Seminar 1** Course prerequisite: PhD in Nursing; completion of 30 core credits; by permission only. Methods to synthesize material from coursework to present and analyze scholarly nursing science knowledge. S, F grading.
- 594 Community-Based Care of At-Risk Adults and Marginalized Adult Populations 3** Analysis and evaluation of strategies, interventions and programs to promote health of at-risk adults, older adults and marginalized adult populations.
- 595 Internship V 1-10** May be repeated for credit; cumulative maximum 10 hours. Course prerequisite: Admission to FNP program; NURS 562; NURS 563; NURS 581; one of NURS 567, 568, 569, 571, or 572. Application and integration of theoretical content, research findings, and assessment and intervention strategies into primary care practice. S, F grading.
- 596 Nursing Science: Theory and Science of Nursing II 3** Course Prerequisite: NURS 536. Analysis and application of concepts, models, and theories for nursing science research with a focus on vulnerable populations.
- 597 Advanced Topics in Nursing V 1-3** May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Graduate student in Nursing; instructor permission. Specialized topics within the discipline; content will vary each term.
- 598 Advanced Topics in Nursing V 1-3** May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Graduate student in Nursing; instructor permission. Specialized topics within the discipline; content will vary each term.
- 599 Independent Study V 1-18** May be repeated for credit. Course Prerequisite: Graduate student in Nursing; instructor permission. S, F grading.
- 700 Master's Research, Thesis, and/or Examination V 1-18** May be repeated for credit. Course prerequisite: Graduate standing in Nursing. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 702 Master's Special Problems, Directed Study, and/or Examination V 1-18** May be repeated for credit. Course prerequisite: Graduate standing in Nursing. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.
- 799 Dissertation Seminar 1** May be repeated for credit. Course prerequisite: Graduate standing in Nursing. Best practices for doctoral research and presentation. S, F grading.
- 800 Doctoral Research, Dissertation, and/or Examination V 1-18** May be repeated for credit. Course Prerequisite: Admitted to the Nursing PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Department of Nutrition and Exercise Physiology

spokane.wsu.edu/admissions/nutrition-exercise/
665 N. Riverpoint Blvd. #306
509-358-7811

Professor and Chair, Glen Duncan; Professor, John Roll; Clinical Assistant Professors, J.K. Beary, A. Davis, S. Kynast-Gales, J. Knuth, L. Miller; Instructors, M. McMulkin, S. Niehuser, B. Sponseller.

The Nutrition and Exercise Physiology Program is the only research program in the state of Washington that integrates nutrition with experimental and clinical exercise physiology.

The Bachelor of Science in Nutrition and Exercise Physiology is a unique, interdisciplinary undergraduate degree in the health sciences that focuses on the effects of exercise and nutrition on the health of individuals. Supporting prerequisite coursework, detailed in the Program of Study (below), provides a broad knowledge base in human anatomy, physiology, nutrition, chemistry, biochemistry, and microbiology; however, the primary focus of the upper division major is on clinical exercise physiology and nutrition.

The degree offers an integrative curricular approach in which students gain a unique perspective on how and why the human body responds to various exercise and nutritional stimuli through didactic and experiential assessment of molecular, genetic, clinical, social/psychological, and environmental factors. Students gain experiential learning through laboratories and practicum focusing on exercise physiology and nutrition, followed by a semester-long internship.

At the completion of their undergraduate B.S. program, students will be expected to demonstrate effective written, oral, and visual communication skills in a variety of settings and environments for target audiences; apply knowledge of physical, chemical, and biological sciences to exercise and nutrition sciences; apply knowledge of behavioral and social sciences to exercise and nutrition habits of diverse populations; demonstrate the ability to use, interpret, evaluate, and apply research principles to exercise and nutrition interventions; demonstrate the application of exercise programming and nutrition recommendations for the prevention or management of chronic disease; demonstrate their understanding of the role of healthcare systems and public policy in the maintenance and achievement of health; demonstrate critical thinking skills gained throughout the Nutrition and Exercise Physiology curriculum by utilizing problem-solving activities and assignments; perform exercise and nutrition programming and work effectively as a team member in a variety of settings such as acute care, rehabilitation facilities and community health facilities; be well informed regarding the characteristics of various health and fitness settings and factors that impact their operation such as policies, regulatory agencies, reimbursement/funding, and legislative issues; and model professional skills and behaviors, including social responsibility, ethical practice, and a commitment to lifelong learning.

Graduates will be prepared for successful and rewarding careers and job opportunities including: cardiac and pulmonary rehabilitation clinical

programs; community health centers; university and worksite wellness programs; exercise and health promotion, and commercial fitness centers. Graduates who complete an approved clinical internship will be qualified to test for American College of Sports Medicine Certified Clinical Exercise Professional (CEP) credential. In addition, graduates may seek admission to graduate programs in nutrition and exercise physiology.

The non-thesis Master of Science Coordinated Program in Dietetics, Nutrition, and Exercise Physiology (CPD NEP), is a coordinated program in dietetics with an exercise emphasis. The program is accredited by the Accreditation Council for Education in Nutrition and Dietetics (ACEND), the accrediting agency for the Academy of Nutrition and Dietetics (AND). Successful completion of this MS program prepares students to test for the Registered Dietitian Nutritionist (RDN) credential.

The Program in Nutrition and Exercise Physiology also offers the Doctor of Philosophy (Ph.D.) in Nutrition and Exercise Physiology (temporarily on hold). The Ph.D. offers a unique opportunity to pursue research interests in nutrition and/or exercise physiology, from a molecular, clinical and/or behavioral approach.

This curriculum provides a foundation in the study of the cellular and molecular mechanisms that regulate physiological responses. It also provides a foundation in assessment and outcome measures in community nutrition and health programs. The research interests of the faculty include cellular and molecular signal transduction processes in cancer, sociocultural factors that influence dietary practices, clinical exercise physiology, and nutrition education.

Applications for admission to the graduate programs must include: Official GRE scores, official transcripts for all college level work, three letters of recommendation, resume, and a purpose statement discussing career goals and research interests. For students whose native language is not English, TOEFL scores above 100 (Internet based) are required.

WSU students based in Pullman may work with Mary Ohnemus, the Pre-NEP Advisor: mohnemus@wsu.edu 509-335-4549. Students from colleges or universities other than WSU Pullman will need to contact the Academic Coordinator in the Program in Nutrition and Exercise Physiology to determine appropriate prerequisites: nep.advising@wsu.edu; 509-358-7811.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

BACHELOR OF SCIENCE IN NUTRITION AND EXERCISE PHYSIOLOGY (120 HOURS)

First Year

First Term	Hours
CHEM 101 [PSCI] or 105 [PSCI]	4
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3
MBIOS 101 [BSCI]	4

Second Term	Hours
BIOLOGY 102, 106, or 107	4

CHEM 102 or 106	4
HISTORY 105 [ROOT]	3
Elective	1

Second Year

First Term	Hours
BIOLOGY 251	4
Diversity [DIVR]	3
PHIL 103 [HUM] or 365 [HUM]	3
STAT 205 [QUAN] or 212 [QUAN]	3 or 4

Second Term	Hours
BIOLOGY 333	3
COM 102 [COMM]	3
KINES 262 or BIOLOGY 315	4
PSYCH 105 [SSCI]	3
Complete Writing Portfolio	

Third Term	Hours
Summer Session @WSU Spokane, NEP 320	3

Third Year

First Term	Hours
WSU Spokane	
NEP 300 [M]	2
NEP 340	3
NEP 400	3
NEP 427	3
NEP 463	4

Second Term	Hours
WSU Spokane	
NEP 402	2
NEP 435	4
NEP 465 [M]	3
NEP 470	3
NEP 476	3

Fourth Year

First Term	Hours
WSU Spokane	
NEP 362	3
NEP 458	3
NEP 478	3
NEP 479	3

Second Term	Hours
WSU Spokane	
Integrative Capstone [CAPS]	3
NEP 450	3
NEP 479	3
NEP 480	4

Third Term	Hours
NEP 490	10

Description of Courses

NUTRITION AND EXERCISE PHYSIOLOGY

NEP

320 Strength Training and Conditioning; Theory and Application 3 Course Prerequisite: Certified major in nutrition and exercise physiology, or admitted to the Master of Science in Coordinated Program in Dietetics, Nutrition, and Exercise Physiology. Application of scientific principles of strength and conditioning as they relate to exercise training.

340 Foods with Application to Physical Activity 3 (2-3) Course Prerequisite: Certified major in nutrition and exercise physiology, or admitted to the Master of Science in Coordinated Program in Dietetics, Nutrition, and Exercise Physiology. Experimental approach to physical, chemical and sensory properties of foods; overview of culinary techniques, technology and application to physical activity.

362 Biomechanical Analysis 3 Applied sport, clinical and occupational biomechanics.

370 Physiological Biochemistry 3 Course Prerequisite: 8 hours of CHEM; 3 hours BIOLOGY. Biochemical foundations of human physiology; biochemistry of carbohydrate, amino acid, and lipid homeostasis from the molecular to the physiological level.

400 Macronutrient Metabolism 3 Course Prerequisite: Certified major in nutrition and exercise physiology, or admitted to the Master of Science in Coordinated Program in Dietetics, Nutrition, and Exercise Physiology. Digestion, absorption, and metabolism of carbohydrates, protein and fats, and their utilization for energy.

401 Community Supervised Practice 9 Course Prerequisite: Certified major in nutrition and exercise physiology, or admitted to the Master of Science in Coordinated Program in Dietetics, Nutrition, and Exercise Physiology. Advanced principles of community dietetic nutrition education along with hands-on community supervised practice experience.

402 Vitamin and Mineral Metabolism 3 Course Prerequisite: Certified major in nutrition and exercise physiology, or admitted to the Master of Science in Coordinated Program in Dietetics, Nutrition, and Exercise Physiology. Absorption and metabolism of vitamins and minerals and their role in macronutrient metabolism and nutritional requirements for maintenance of health.

427 Nutritional Assessment and Lifestyle Counseling 3 (2-3) Course Prerequisite: Certified major in nutrition and exercise physiology, or admitted to the Master of Science in Coordinated Program in Dietetics, Nutrition, and Exercise Physiology. Basic skills and concepts of nutrition assessment and lifestyle counseling of ambulatory adults using dietary intakes, menu planning and communication skills.

435 Exercise, Diet and Disease 4 Course Prerequisite: NEP 400; NEP 402 or concurrent enrollment; NEP 463. Pathophysiology of disease and implications for dietary and exercise interventions.

437 Diet Therapy 4 Course Prerequisite: Certified major in nutrition and exercise physiology, or admitted to the Master of Science in Coordinated Program in Dietetics, Nutrition, and Exercise Physiology. Theoretical and practical base for diet modification and nutritional therapy in health and a variety of disease states.

- 440 Clinical Supervised Practice** 11 Course
Prerequisite: Certified major in nutrition and exercise physiology, or admitted to the Master of Science in Coordinated Program in Dietetics, Nutrition, and Exercise Physiology. Professional supervised experience offsite in clinical dietetics. Meets American Dietetic Association requirements for registration eligibility. S, F grading.
- 450 Management and Facilities** 3 Course
Prerequisite: Certified major in nutrition and exercise physiology, or admitted to the Master of Science in Coordinated Program in Dietetics, Nutrition, and Exercise Physiology. Essential skills and guidelines for those in the health facility industry in establishing and maintaining a safe and proper facility.
- 451 Management Practices in Food Service** 5 (1-12) Course Prerequisite: Certified major in nutrition and exercise physiology, or admitted to the Master of Science in Coordinated Program in Dietetics, Nutrition, and Exercise Physiology. Advanced principles of food systems; institutional food service management along with offsite, hands-on food service supervised practice experience.
- 458 Nutrition and Exercise Throughout the Life Cycle** 3 Physical activity relating to nutritional needs and dietary patterns from infancy through old age and including maternal nutrition.
- 463 Advanced Exercise Physiology** 4 (3-3) Course Prerequisite: Certified major in nutrition and exercise physiology, or admitted to the Master of Science in Coordinated Program in Dietetics, Nutrition, and Exercise Physiology. Advanced undergraduate exercise physiology with emphasis on mechanisms regulating physiological responses to exercise across the life span.
- 476 Exercise Testing and Prescription** 3 (2-3) Course Prerequisite: Certified major in nutrition and exercise physiology, or admitted to the Master of Science in Coordinated Program in Dietetics, Nutrition, and Exercise Physiology. Principles of exercise testing and prescription based on current practices in physical education, physiology, and rehabilitation.
- 478 Electrocardiography, Medications and Procedures** 3 (2-3) Development of ECG interpretation skills, including 12-leads, with emphasis on procedures and impact of medication in resting and exercising persons.
- 479 Nutrition and Exercise Practicum I** 3 (1-6) Course Prerequisite: NEP 427; NEP 476. Supervised experience in applying exercise and nutrition assessment techniques and developing exercise and nutrition prescription for normal and diseased subjects.
- 480 Cardiopulmonary Rehabilitation** 4 (3-3) Course Prerequisite: Certified major in Nutrition and Exercise Physiology. Principles and applications of exercise assessment/prescription and nutrition recommendations and program management to cardiopulmonary and rehabilitation situations and populations.
- 482 Nutrition and Exercise Practicum II** 3 (1-6) Course Prerequisite: NEP 427; NEP 476; NEP 479. Supervised experience in applying exercise and nutrition assessment techniques for normal and diseased subjects.
- 489 Exercise Internship Seminar** 1 Course prerequisite: Senior standing or graduate student in Nutrition and Exercise Physiology. Learn and complete the process for an exercise internship.
- 490 Exercise and Nutrition Internship** V 10 (0-30) to 15 (0-45) Course Prerequisite: By department permission. Supervised offsite exercise field experience to assess normal and diseased populations and develop/apply exercise prescriptions and nutrition recommendations. S, F grading.
- 499 Special Problems** V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 501 Community Supervised Practice** 5 (1-12) Review of literature in dietetic education and health promotion including supervised practice in community facilities.
- 520 Research Methods in Nutrition and Exercise Physiology** 3 Current research designs and methods in nutrition and exercise physiology including behavioral and basic sciences emphasizing chronic disease prevention.
- 526 Advanced Community Nutrition and Health** 3 Research basis of practice in community nutrition or health programs; assessment and outcome measures emphasizing chronic disease prevention.
- 537 Advanced Medical Nutrition Therapy** 5 Exercise and nutrition assessment/prescription and program management in rehabilitation for populations in various disease states.
- 540 Clinical Supervised Practice** 11 Course Prerequisite: NEP 537. Clinical supervised practical experience for graduate students in coordinated program in dietetics.
- 542 Science and Practice of Clinical Nutrition** 2 The science and practice of clinical nutrition using a case-based and presentation/ discussion format.
- 551 Management Practices in Food Service** 5 (1-12) Course Prerequisite: Admission to the Coordinated Program in Dietetics. Advanced principles and supervised experience in food systems, institutional food service management, school food service and community feeding programs.
- 573 Nutrition in the Community** 2 Public health from a nutrition perspective including current issues in nutrition healthcare, overview of existing programs and assessment of program planning.
- 580 Advanced Topics in Exercise Physiology** 3 Advanced topics in cellular and molecular physiology.
- 585 Clinical Exercise Physiology** 4 Exercise and nutrition assessment/prescription and program management in rehabilitation for populations in various disease states.
- 597 College of Pharmacy Graduate Seminar** 1 May be repeated for credit; cumulative maximum 12 hours. (Crosslisted course offered as PHARMSCI 597, NEP 597.) S, F grading.
- 600 Special Projects or Independent Study** V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination** V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 702 Master's Special Problems, Directed Study, and/or Examination** V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.
- 800 Doctoral Research, Dissertation, and/or Examination** V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Nutrition and Exercise Physiology PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

The Pharmaceutical Sciences Graduate Program

www.pharmacy.wsu.edu/prospectivestudents/graduateprograms.html

Professor and Dean, G. M. Pollack; Professor and Associate Dean for Graduate Education, K. E. Meier; Professor and Chair, Department of Pharmaceutical Sciences, P. Lazarus; Professor and Chair, Department of Pharmacotherapy, J. R. White; Professor and Chair, Section of Experimental and Systems Pharmacology, K.M. Gibson; Professor, J. Zhu; Associate Professors, S. Ahmed, S. S. Daoud, E. D. Liu, S. A. Marsh, J. J. Neumiller, M. Paine, G. D. Trobridge; Assistant Professors, S. Gaddameedhi, Z. Wang; Associate Research Professors, G. Chen, S. Tolmachev, Z. Xia, H. Zhang; Assistant Research Professor, P. Srivastava; Clinical Professors, A. Lazarus, J-B Rouillet; Clinical

Associate Professors, S. Wang, L. J. Woodard; Clinical Assistant Professors, T. Denton, J. Padowski, C. Remsburg.

The mission of the Graduate Program in the Pharmaceutical Sciences is to prepare our students as scientists with the broader skills needed to excel in a career path of their choice, including in the academic, industrial, and regulatory sectors. We utilize multi-disciplinary basic and translational research approaches to (1) understand mechanisms of disease, (2) identify novel therapeutic targets, (3) develop novel treatments, and (4) optimize therapeutic regimens. Major areas of research focus are cancer biology, drug discovery, and translational pharmacology. We strive to prepare students to become independent and creative problem solvers who will develop into leaders in their respective fields.

Students entering the program should have completed undergraduate work that includes biology, chemistry (including organic chemistry and biochemistry), mathematics (through calculus), and organ/mammalian physiology course. Students working toward the PhD in Pharmaceutical Science are expected to develop an area of research emphasis that is consistent with the capabilities and interests of the faculty.

A PharmD/PhD combined degree option is available to train clinician scientists. Interested students may apply for PhD admission concurrently with their PharmD application, or alternatively during the first two years of their progression through the PharmD program.

Student Learning Outcomes

- A-1. Achieve mastery of knowledge in the general field of Pharmaceutical Sciences.
- A-2. Develop the expertise to use appropriate methodologies to solve novel and emerging problems related to the field of Pharmaceutical Sciences.
- A-3. Disseminate research findings to local, regional, national, and international audiences primarily through publication in peer-reviewed journals and presentations at conferences.
- A-4. Participate in professional organizations, including becoming members, attending meetings, and taking leadership roles where appropriate.
- A-5. Participate in teaching, internships, fellowships, workshops, credentialing, and grant applications to enhance competitiveness for career opportunities as appropriate.
- B-1. Develop critical, integrative, and evaluative thinking at the highest levels of rigor.
- B-2. Develop advanced written and oral communication skills.
- B-3. Become independent, self-motivated researchers with the ability to identify specific problems in their field of expertise and to formulate solutions to these problems.
- B-4. Develop a comprehensive knowledge of previous and current research in their field of expertise and be able to demonstrate that knowledge capability in a review of the literature at a level that is potentially publishable.
- B-5. Generate innovative questions within their field of expertise and pose hypotheses related to those questions.
- B-6. Apply sound methodological approaches to test hypotheses related to specific research questions and describe the methods effectively.

- B-7. Perform statistical analyses of research data and present the results in a way that clearly describes the data.

Applications for admission to the graduate program must include: Official GRE scores, official transcripts for all college level work, three letters of recommendation, and a letter discussing career goals, previous research experience, and research interests. For students whose native language is not English, TOEFL scores are required. Inquiries should be emailed to: gradprograms@pharmacy.wsu.edu.

Description of Courses

PHARMACEUTICAL SCIENCES GRADUATE PROGRAM

PHARMSCI

512 Topics in Pharmacology V 1-4 May be repeated for credit; cumulative maximum 12 hours. Topics of current interest in pharmacology and closely related disciplines.

520 Foundations of Molecular Regulation 3 Principles of molecular biology, genetics, and biochemistry used to develop therapeutic approaches to the treatment and prevention of human disease.

530 Foundations of Cellular Regulation 3 Fundamentals of pharmacology and toxicology; signal transduction; cellular effects of diet and exercise; action and regulation of dietary supplements.

540 Fundamentals of Chronopharmacology 3 Role of the circadian clock in pharmacology as it relates to therapeutic efficacy; special emphasis on anti-cancer drug treatment.

555 General and Cellular Physiology 4 (3-3) Physicochemical mechanisms of cellular function. (Crosslisted course offered as VET PH 555, PHARMSCI 555). Recommended preparation: Concurrent enrollment in MBIOS 513.

560 Molecular and Cellular Methods in Biomedical Sciences 3 Basic experimental methods and approaches in cell and molecular biology, with an emphasis on practical skills and their appropriate application.

565 Drug Delivery 3 Comprehensive overview of drug delivery at the molecular, cellular, and organ levels; concepts and approaches as applied to multiple diseases.

572 Fundamentals of Oncology 3 Course Prerequisite: By permission only. Thorough overview of cancer biology encompassing basic cellular and molecular mechanisms of carcinogenesis and tumor progression, treatment and prevention.

573 Principles of Pharmacokinetics and Toxicokinetics 3 Pharmacokinetic, pharmacodynamic, and toxicokinetic systems; mathematical model development utilizing common kinetic systems.

575 Receptor-Ligand Interactions 3 Interactions of drugs with biological macromolecules constituting the physicochemical basis of drug action.

576 Biophysical Methods 3 Biophysical methods separating or detecting analytes based on their physical interactions with a support matrix or energy.

577 Responsible Conduct in Biomedical Research 3 Training in biomedical research ethics consistent with NIH requirements; introduction to literature searching and analysis, scientific writing, and oral presentations.

578 Applied Biostatistics 3 Research process; techniques for conducting health sciences research and evaluation; critique published health sciences research and collect, utilize, and evaluate primary and secondary data.

579 Advances in Pharmaceutical Sciences 3 Introduces entering graduate students to diverse concepts regarding advances in pharmaceutical sciences in the areas of drug discovery, targeted drug actions and reactions, molecular mechanisms of drug actions and nutraceuticals.

580 Gene and Stem Cell Therapies 3 Stem cell therapeutics, gene transfer vectors and methods for isolating and generating stem cells; stem cell therapeutics, presentation skills and evaluation of primary literature.

581 Stem Cell Biology, Therapeutics and Regenerative Medicine 3 Provides information on the latest cutting edge research in the areas of stem cell biology and tissue regeneration; covers stem cell therapeutics, gene transfer vectors and methods for isolating, characterizing, and generating stem cells. (Course offered as PHARMSCI 581, ANIM SCI 581).

597 College of Pharmacy Graduate Seminar 1 May be repeated for credit; cumulative maximum 12 hours. (Crosslisted course offered as PHARMSCI 597, NEP 597.) S, F grading.

600 Special Projects or Independent Study V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.

700 Master's Research, Thesis, and/or Examination V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Pharmaceutical Sciences PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

College of Pharmacy

www.pharmacy.wsu.edu
Spokane
509-368-6700

COLLEGE OF PHARMACY Dean and Professor, G. Pollack; Associate Dean and Professor, D. E. Baker; Associate Dean and Clinical Professor, B. J. Gates; Associate Dean and Clinical Professor, A. Lazarus; Associate Dean and Clinical Professor, L. G. MacLean; Associate Dean and Professor, K.E. Meier. DEPARTMENT OF PHARMACEUTICAL SCIENCES: Professor and Chair, P. Lazarus; Professors, K. E. Meier, J. Zhu; Associate Professors, S. Ahmed, S. S. Daoud, D. X. Liu, G. Trobridge; Assistant Professor, Z. Wang; Clinical Associate Professors, S. Wang; Clinical Assistant Professors, T. T. Denton, C. M. Remsberg. DEPARTMENT OF PHARMACOTHERAPY: Professor and Chair, J. R. White; Professors, D. E. Baker, T. L. Skaer; Associate Professor, J. J. Neumiller; Clinical Professors, B. J. Gates, T. L. Levien, L. G. MacLean; Clinical Associate Professors, B. Bray, J. D. Robinson, C. R. Schwartz, A. Stewart, M. Willson, L. Woodard; Clinical Assistant Professors, J. Akers, A. Blum, C. Buchman, J. Clark, A. Kim, L. Koren-Selfridge, K. McKeirnan, C. Mikota, C. Newsome, S. Panther, T. Sargent. EXPERIMENTAL AND SYSTEMS PHARMACOLOGY: Professor and Chair, M. Gibson; Associate Professors, S. Marsh, M. F. Paine; Assistant Professor, S. Gaddameedhi; Clinical Professors, A. Lazarus, J-B Roulet; Clinical Assistant Professors, A. Ahmed, D. Brand-Eubanks, J. Padowski.

The College of Pharmacy offers a course of study leading to a Doctor of Pharmacy (PharmD) degree. The PharmD schedule of studies involves four professional years. The first three professional years of the PharmD curriculum are delivered on the WSU Health Sciences campus in Spokane, Washington and on a satellite campus located in Yakima on the campus of Pacific Northwest University Health Sciences (PNWU). The fourth professional year of the PharmD curriculum consists of advanced experiential training, in which students are assigned to one of the following geographic locations: Spokane, Yakima, Vancouver, Tri-Cities, Tacoma, Olympia, Wenatchee, or Pullman. Student pharmacists are expected to complete the majority of their rotations in their assigned geographic locations. Student pharmacists will gain experience in a variety of health care environments, including community, institutional, acute care and long-term care settings. One hundred and thirty five student pharmacists on the Spokane campus and thirty five student pharmacists on the Yakima campus are enrolled annually every fall in the first professional year of the PharmD program.

The application period each academic year is from July to January and students should prepare and submit their application one calendar year before they intend to begin the pharmacy program. Although a bachelor degree is not required for admission, pre-requisites for admission require three years of pre-pharmacy education. Because the number of applicants to the professional program exceeds the number that can be admitted, no assurance can be given that those who successfully complete the pre-pharmacy requirements will be admitted to the Doctor of Pharmacy program. For additional information regarding the Doctor

of Pharmacy curriculum, please see the College of Pharmacy home page at <http://www.pharmacy.wsu.edu>, or contact the College of Pharmacy Office of Student Services at 509-368-6605.

Student Learning Outcomes

We expect our Doctor of Pharmacy graduates to successfully achieve the following competency-based outcomes:

Outcome 1 – Knowledge Acquisition and Critical Thought: The graduate shall acquire, analyze, synthesize, and apply knowledge in biomedical, pharmaceutical, and clinical sciences to facilitate positive therapeutic outcomes and prevent drug therapy related misadventures.

Outcome 2 – Communication: The graduate shall acquire a repertoire of verbal, non-verbal, and written communication skills, demonstrate professional level competency in applying these skills in a variety of cultural and practice contexts, and select appropriate methods for use in all facets of pharmacy practice.

Outcome 3 – Professionalism: The graduate shall practice ethically within the boundaries of the laws of pharmacy, uphold values and integrity embodied in the practice of pharmacy, and provide leadership/influence for the improvement of the profession. Outcome 4 – Knowledge of the Profession, Professional Development, and Public Service: The graduate shall thoroughly understand the profession, assume responsibility for continuous professional development, and provide leadership/influence for the improvement of the health and wellness of individuals and society.

Outcome 5 – Medication Therapy Management: The graduate shall integrate and apply requisite biomedical, pharmaceutical, and clinical sciences, and communication skills, to evaluate, design, implement, and monitor optimal patient-centered pharmacotherapy plans, educate patients, identify and resolve drug related problems, and assure patient safety.

Outcome 6 – Management Systems, Processes and Operations: The graduate shall understand multiple factors/perspectives in US healthcare systems delivery; medication distribution, control, and quality management systems; and pharmacy management systems, policies, and operations to optimize patient/population outcomes.

Pharmacy Prerequisites for Admission to the Professional Pharmacy Program

(Students transferring from the quarter system will have transferrable credits converted to semester credits upon acceptance into the PharmD program. All transfer credits will be evaluated by WSU Admissions office. Please refer to our information page on PharmCAS for the most up to date information on pre-required coursework and application requirements.)

- Written Communication I – 3 credits
- Written Communication II – 3 credits
- Philosophy – Logic, Critical Thinking or Ethics – 3 credits
- Microeconomics – ECONS 101 – 3 credits
- Introductory Psychology – PSYCH 105 – 3 credits
- Calculus – MATH 140 or 171 or 202 – 3-4 credits
- Statistics – STAT 212 – 3 credits

- Introductory Biology – BIOLOGY 106 and 107 – 8 credits
- Principles of Chemistry – CHEM 105 and 106 – 8 credits
- Organic Chemistry – CHEM 345 and 348 – 8 credits
- Microbiology – MBIOS 305 – 3 credits
- Microbiology and Molecular Biology Laboratory – MBIOS 304 – 3 credits
- Human Anatomy with lab – BIOLOGY 315 – 4 credits
- Advanced Human Physiology – BIOLOGY 353 – 4 credits
- Biochemistry – MBIOS 303 – 4 credits

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

PROFESSIONAL CURRICULUM (134 HOURS)

First Year

<i>First Term</i>	<i>Hours</i>
PHARDSCI 502	4
PHARDSCI 504	1
PHARDSCI 508	3
PHARDSCI 528	3
PHARMACY 507	1
PHARMACY 509	1
PHARMACY 516	2

<i>Second Term</i>	<i>Hours</i>
PHARDSCI 510	2
PHARDSCI 512	4
PHARDSCI 518	2
PHARDSCI 519	1
PHARMACY 501	1
PHARMACY 513	1
PHARMACY 514	4
Electives ¹	2

Second Year

<i>First Term</i>	<i>Hours</i>
PHARDSCI 532	4
PHARMACY 530	2
PHARMACY 531	1
PHARMACY 533	3
PHARMACY 534	4
PHARMACY 545	3
PHARMACY 565	2
Electives ¹	2

<i>Second Term</i>	<i>Hours</i>
PHARDSCI 542	4
PHARMACY 541	1
PHARMACY 543	1
PHARMACY 544	4
PHARMACY 546	2
PHARMACY 558	2
PHARMACY 559	2
Electives ¹	2

Third Year

<i>First Term</i>	<i>Hours</i>
PHARMACY 551	2
PHARMACY 553	3

PHARMACY 554	4
PHARMACY 566	3
PHARMACY 567	2
Electives ¹	2

<i>Second Term</i>	<i>Hours</i>
PHARMACY 555	4
PHARMACY 557	4
PHARMACY 561	2
PHARMACY 563	2
PHARMACY 564	3
Electives ¹	2

Fourth Year

<i>First Term</i>	<i>Hours</i>
Advanced Pharmacy Practice Experiences (APPE) ²	15

<i>Second Term</i>	<i>Hours</i>
Advanced Pharmacy Practice Experiences (APPE) ²	15

¹ Elective Courses: 10 credits of electives involving a minimum of 4 courses are required throughout the first three years of the curriculum. Select from: PHARMACY 499, 576 through 580, 588, 590, 591, 594, 596, 598, 599 or any other College approved electives.

² Advanced Pharmacy Practice Experiences (APPE) courses are: PHARMACY 581, 582, 583, 584, 585, 586, 587.

Description of Courses

PHARMACY

PHARMACY

399 Mentored Writing Skills Development

1 Course Prerequisite: Admission to Pharmacy program; permission of instructor. Individual faculty mentoring to improve written communication skills. H, S, F grading.

499 Special Problems V 1-4 May be repeated for credit; cumulative maximum 12 hours. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. H, S, F grading.

501 Applied Patient Care I: Patient Assessment 1 (0-3) Course Prerequisite: Admission to Pharmacy program. Laboratory course teaching hands-on physical assessment techniques from a pharmacy perspective, to provide patient-specific care. H, S, F grading.

507 Introduction to Therapeutic Agents: Top 200 Drugs 1 (0-2) Course Prerequisite: Admission to Pharmacy program. Drugs most frequently prescribed in the US as a basis for pharmacy practice. H, S, F grading.

509 Professional Communications Lab 1 (0-3) Course Prerequisite: Admission to Pharmacy program. Professional communication skills as an essential foundation for career development. H, S, F grading.

513 Introductory Pharmacy Practice Experience I 1 Course Prerequisite: PHARDSCI 504. Prepares student pharmacists for community practice experience and service learning activities. H, S, F grading.

514 Pharmacotherapy I 4 Course Prerequisite: PHARDSCI 502; PHARMACY 507. First in a sequence of courses that focuses on the clinical use of medications in the prevention, mitigation, or cure of disease. H, S, F grading.

516 Health Care Systems 2 Course Prerequisite: Admission to Pharmacy program. US healthcare system, financing of health care delivery and the role of the pharmacist. H, S, F grading.

530 Point of Care and Clinical Services 2 Course Prerequisite: PHARDSCI 504; PHARMACY 501; PHARMACY 513. Providing point of care and clinical services in a pharmacy setting. H, S, F grading.

531 Applied Patient Care II: Clinical Assessment and Documentation 1 (0-3) Course Prerequisite: PHARDSCI 504; PHARMACY 501. Clinical assessment and documentation skills necessary for effective pharmaceutical care. H, S, F grading.

533 Introductory Pharmacy Practice Experience II 3 (0-9) Course Prerequisite: PHARDSCI 504; PHARMACY 513. Authentic practice situations and service learning with opportunities for discussion and reflection. H, S, F grading.

534 Pharmacotherapy II 4 Course Prerequisite: PHARDSCI 512; PHARMACY 514. Second in a sequence of courses that focuses on the clinical use of medications in the prevention, mitigation, or cure of disease. H, S, F grading.

541 Applied Patient Care III: Medication Therapy Management 1 (0-3) Course Prerequisite: PHARMACY 531. Identification of pertinent patient findings, assessment of drug-related problems and clinical problem solving. H, S, F grading.

543 Introductory Pharmacy Practice Experience III 1 Course Prerequisite: PHARMACY 533. Authentic practice situations and service learning with opportunities for discussion and reflection. H, S, F grading.

544 Pharmacotherapy III 4 Course Prerequisite: PHARMACY 534. Third in a sequence of courses that focuses on the clinical use of medications in the prevention, mitigation, or cure of disease. H, S, F grading.

545 Pharmacy Management 3 Course Prerequisite: Admission to Pharmacy program. Management principles essential for common practice settings in the profession of pharmacy. H, S, F grading.

546 Selected Topics in Pharmacy Practice 2 Course Prerequisite: PHARMACY 516. Interactive course addressing economic, ethical and professional aspects of health care delivery. H, S, F grading.

551 Applied Patient Care IV: Advanced Medication Therapy Management 2 (1-3) Course Prerequisite: PHARMACY 541. Medication therapy management for complex patients; case-based discussions and human patient simulation. H, S, F grading.

553 Introductory Pharmacy Practice Experience IV 3 (0-9) Course Prerequisite: PHARMACY 543. Authentic practice situations and service learning with opportunities for discussion and reflection. H, S, F grading.

554 Pharmacotherapy IV 4 Course Prerequisite: PHARMACY 544. Fourth in a sequence of courses that focuses on the clinical use of medications in the prevention, mitigation, or cure of disease. H, S, F grading.

555 Drug Information and Literature Evaluation 4 Course Prerequisite: PHARMACY 544. Evaluation of drug information in pharmaceutical and biomedical literature to provide better patient care. H, S, F grading.

557 Pharmacotherapy V 4 Course Prerequisite: PHARMACY 554. Fifth in a sequence of courses that focuses on the clinical use of medications in the prevention, mitigation, or cure of disease. H, S, F grading.

558 Applied Clinical Pharmacokinetics 2 Course Prerequisite: PHARDSCI 528. Clinical applications of pharmacokinetics including theoretical background and application to patient care. H, S, F grading.

559 Quality Assurance and Patient Safety 2 Course Prerequisite: PHARMACY 531; PHARMACY 534. Patient safety issues including quality assurance, medication error avoidance and risk management in healthcare systems. H, S, F grading.

561 Applied Patient Care V: Integrated Patient Care 2 (1-3) Course Prerequisite: PHARMACY 551. Integration of pharmaceutical care with an interdisciplinary emphasis using patient cases and human patient simulation. H, S, F grading.

563 Introductory Pharmacy Practice Experience V 2 Course Prerequisite: PHARMACY 553. Authentic practice situations and service learning with opportunities for discussion and reflection. H, S, F grading.

564 Pharmacy Law and Regulatory Affairs 3 Course Prerequisite: PHARMACY 551; PHARMACY 553. Legal and ethical pharmacy practice including licensing, patient privacy protection, order fulfillment and contracts. H, S, F grading.

565 Parenteral Products 2 (0-4) Course Prerequisite: PHARDSCI 519. Preparation and administration of compounded parenteral products; patient case discussions and student presentations. H, S, F grading.

566 Therapeutics of Special Populations 3 Course Prerequisite: PHARMACY 544. Special therapeutic needs of unique populations including pediatrics, chronic neurologic disorders, hospice care and immunocompromised patients. H, S, F grading.

567 Public Health and Emergency Preparedness and Response 2 Course Prerequisite: PHARMACY 541; PHARMACY 544. Interdisciplinary students (pharmacy, nursing, medicine) working and learning together using patient cases. H, S, F grading.

- 576 Survey of Organ Transplant and Immunosuppressive Drugs** 1 Course Prerequisite: Admission to Pharmacy program. An overview of human transplantation by systems and the immunosuppressive regimens employed to prevent organ rejection. H, S, F grading.
- 577 Diseases, Complications, and Drug Therapy in Obstetrics** 2 Course Prerequisite: PHARDSCI 532; admission to Pharmacy program. Medical and pharmacological issues common in obstetrics. H, S, F grading.
- 578 Leadership and Professional Development** 2 Skills, traits, and values required by leaders seeking to influence change in the pharmacy profession and health care. H, S, F grading.
- 579 Diabetes Prevention** 2 Course Prerequisite: PHARMACY 544. Preparation for educating patients in diabetes prevention and promoting health and wellness in the community. H, S, F grading.
- 580 Practical Politics and Pharmacy** 1 Course Prerequisite: Admission to Pharmacy program. Study of government and legislation to better assist patients in navigating the political process. H, S, F grading.
- 581 Acute Care Advanced Practice Experience** 5 (0-15) Course Prerequisite: Admission to Pharmacy program. Advanced practice experience in acute care settings. H, S, F grading.
- 582 Ambulatory Care Advanced Practice Experience** 5 (0-15) Course Prerequisite: Admission to Pharmacy program. Advanced practice experience in ambulatory care settings. H, S, F grading.
- 583 Community Advanced Practice Experience** 5 (0-15) Course Prerequisite: Admission to Pharmacy program. Advanced practice experience in a community pharmacy setting. H, S, F grading.
- 584 Institutional Advanced Practice Experience** 5 (0-15) May be repeated for credit; cumulative maximum 5 hours. Course Prerequisite: Admission to Pharmacy program. Advanced practice experience in an institutional pharmacy setting. H, S, F grading.
- 585 Elective I Advanced Practice Experience** 5 (0-15) Course Prerequisite: Admission to Pharmacy program. Advanced practice experience in acute or ambulatory patient care settings. H, S, F grading.
- 586 Elective II Advanced Practice Experience** 5 (0-15) Course Prerequisite: Admission to Pharmacy program. Advanced practice experience in acute, ambulatory, or non-traditional patient care. H, S, F grading.
- 587 Elective III Advanced Practice Experience** 5 (0-15) Course Prerequisite: Admission to Pharmacy program. Advanced practice experience in various health care settings. H, S, F grading.
- 588 Special Topics** 2 Contemporary issues in pharmacy. H, S, F grading.
- 589 Repeat Advanced Practice Experience** 5 (0-15) Course Prerequisite: Admission to Pharmacy program. Advanced pharmacy practice experience that provides an opportunity for pharmacy students to repeat a required advanced practice experience. H, S, F grading.
- 590 Advanced Topics in Infectious Disease** 1 Course Prerequisite: PHARMACY 544. Advanced knowledge of infectious disease topics covered in therapeutic pharmacy coursework. H, S, F grading.
- 591 Advanced Elective in Critical Care** 2 Course Prerequisite: PHARMACY 554. Elective course: Explores in greater depth the pharmacology and pharmacotherapy encountered in the critical care setting. H, S, F grading.
- 594 Comprehensive Diabetes Management** 3 Course Prerequisite: Admission to Pharmacy program. Multidisciplinary foundation for future health professionals in the principles of diabetes management, using self-paced, modular and internet-based alternative format for delivery. H, S, F grading.
- 596 Entrepreneurship in Pharmacy** 1 Course Prerequisite: Admission to Pharmacy program. Entrepreneurship and innovative pharmacy business plan development. H, S, F grading.
- 598 Elementary Science Education Practicum** 1 (0-2) Course Prerequisite: Admission to Pharmacy program. Communication with children in classroom environment to stimulate future practicing pharmacists to participate in outreach activities as part of science education. H, S, F grading.
- 599 Special Projects** 2 May be repeated for credit; cumulative maximum 4 hours. Laboratory research, clinical research, or comprehensive review of selected subjects. H, S, F grading.
- 510 Basic and Clinical Pharmacogenomics** 2 Course Prerequisite: Admission to Pharmacy program. Introduction to the science involving pharmacogenomics and how this knowledge is clinically applied to individualized patient therapy. H, S, F grading.
- 512 Integrated Pharmacology II** 4 Course Prerequisite: PHARDSCI 502. Integrated hepatic, gastrointestinal, and endocrine pharmacology. H, S, F grading.
- 518 Pharmaceutics II** 2 Course Prerequisite: PHARDSCI 508. Principles of dosage from design and drug delivery, with an emphasis on pharmaceutical technology and biopharmaceutics. H, S, F grading.
- 519 Pharmaceutics Laboratory** 1 (0-3) Course Prerequisite: PHARDSCI 504; PHARDSCI 508. Laboratory experience in the preparation of medicines. H, S, F grading.
- 528 Pharmacokinetics** 3 Course Prerequisite: Admission to Pharmacy program. Qualitative and quantitative understanding of the processes of drug absorption, distribution, and elimination. H, S, F grading.
- 532 Integrated Pharmacology III** 4 Course Prerequisite: PHARDSCI 512. Integrated cardiovascular, pulmonary, and renal pharmacology. H, S, F grading.
- 542 Integrated Pharmacology IV** 4 Course Prerequisite: PHARDSCI 532. Integrated immuno- and anticancer pharmacology. H, S, F grading.
- 599 Special Projects** 2 May be repeated for credit; cumulative maximum 4 hours. Laboratory research, clinical research, or comprehensive review of selected subjects. H, S, F grading.

Physical Education Activity

PEB 26
509-335-1309

Description of Courses

PE-ACTIVITY

Physical Education Activity courses are open to all students. PE ACTIV courses numbered 100 through 174 are for beginners. Those numbered 177 and above are for intermediate or advanced students.

PE ACTIV course credit is granted on the basis of 1 credit for two one-hour classes per week. PE ACTIV courses may not be repeated for credit, with the exception of PE ACTIV 200 Special Topics (1 credit hour, repeatable to a maximum of 4 hours). Courses are graded A, S, or F, except as noted.

Each PE ACTIV course charges a special course fee.

PE ACTIV

101 Beginning Conditioning 1 (0-2) S, F grading.

102 Beginning Conditioning ROTC 1 (0-2) A, S, F grading.

106 Self Defense 1 A, S, F grading.

107 Beginning Judo 1 (0-2) A, S, F grading.

- 108 Karate** 1 (0-2) A, S, F grading.
- 112 Weight Training** 1 (0-2) S, F grading.
- 114 Beginning Gym Tumbling** 1 (0-2) A, S, F grading.
- 119 Aerobic Dance** 1 (0-2) S, F grading.
- 120 American Social Dance Men** 1 (0-2) A, S, F grading.
- 121 American Social Dance Women** 1 (0-2) A, S, F grading.
- 122 Beginning Ballet** 1 (0-2) A, S, F grading.
- 126 Beginning Mod Dance** 1 (0-2) A, S, F grading.
- 127 Beginning Jazz Dance** 1 (0-2) A, S, F grading.
- 128 Beginning Swimming** 1 (0-2) A, S, F grading.
- 131 Scuba Diving** 2 (1-3) A, S, F grading.
- 132 Conditioning Swimming** 1 (0-2) S, F grading.
- 133 Water Aerobics** 1 (0-2) S, F grading.
- 140 Jogging** 1 (0-2) S, F grading.
- 141 Beginning Golf** 1 (0-2) A, S, F grading.
- 143 Beginning Bowling** 1 (0-2) A, S, F grading.
- 145 Beginning Fencing Men** 1 (0-2) A, S, F grading.
- 146 Beginning Fencing Women** 1 (0-2) A, S, F grading.
- 150 Beginning Tennis** 1 (0-2) A, S, F grading.
- 153 Ultimate Frisbee** 1 (0-2) A, S, F grading.
- 154 Beginning Racquetball** 1 (0-2) A, S, F grading.
- 158 Beginning Volleyball** 1 (0-2) A, S, F grading.
- 164 Beginning Soccer** 1 (0-2) A, S, F grading.
- 177 Intermediate Racquetball** 1 (0-2) A, S, F grading.
- 200 Special Topics** 1 (0-2) May be repeated for credit; cumulative maximum 4 hours. A, S, F grading.
- 201 Intermediate Conditioning ROTC** 1 (0-2) A, S, F grading.
- 208 Intermediate Karate** 1 (0-2) A, S, F grading.
- 220 Advanced Social Dance Men** 1 (0-2) A, S, F grading.
- 221 Advanced Social Dance Women** 1 (0-2) A, S, F grading.
- 222 Intermediate Ballet** 1 (0-2) A, S, F grading.
- 227 Intermediate Jazz Dance** 1 (0-2) A, S, F grading.
- 241 Intermediate Golf** 1 (0-2) A, S, F grading.
- 242 Advanced Golf** 1 (0-2) A, S, F grading.
- 243 Intermediate Bowling** 1 (0-2) A, S, F grading.
- 250 Intermediate Tennis** 1 (0-2) A, S, F grading.
- 251 Advanced Tennis** 1 (0-2) A, S, F grading.
- 258 Intermediate Volleyball** 1 (0-2) A, S, F grading.

264 Intermediate Soccer 1 (0-2) A, S, F grading.

265 Advanced Soccer 1 (0-2) A, S, F grading.

266 Fly Fishing 1 (0-2) A, S, F grading.

Department of Physics and Astronomy

physics.wsu.edu
Webster 1245
509-335-9532

Chair and Professor, M.D. McCluskey; Regents Professors, J. T. Dickinson, Y. M. Gupta, M. G. Kuzyk, K. G. Lynn; Professors, D. Blume, S. Bose, G. S. Collins, P. Engels, P. L. Marston, S. L. Tomovic; Associate Professors, S. L. Dexheimer, M. Duez, Y. Gu, G. Worthey; Assistant Professors, B. A. Collins, M. Forbes, J. McMahon; Clinical Professor, F. Gittes; Senior Instructors, M. Allen, N. Cerruti.

Physics is the study of nature at its most fundamental level. It is the science upon whose principles all other sciences and technologies are based. A major in physics is ideal preparation not only for further study in physics but also for advanced study in biophysics, medicine, astrophysics, geophysics, chemical physics, engineering, meteorology, and computer science. All of these areas also offer potential careers for the physics major.

Courses offered introduce the student to the major physical theories: mechanics, thermodynamics and statistical physics, electricity and magnetism, and quantum physics. Additional undergraduate courses cover optics, atomic physics, nuclear physics, solid state physics, biological physics, and astrophysics. Students test the theories in laboratories and learn experimental techniques needed to work with modern apparatus such as computers, high-vacuum equipment, lasers, and electronic and optical devices.

Active research programs supported by federal grants and contracts are pursued in the following fields: acoustics (scattering, nonlinear processes, and levitation); astrophysics (planetary, stellar, and galactic structure and evolution); astrophysical generation of gravitational waves, gravitational wave data analysis, cosmology; optical properties of semiconductors; biophysics; nanoscale physics and materials, Bose-Einstein condensates, cluster physics; optical physics (femtosecond laser spectroscopy, scattering from doped polymers, nonlinear optics, quantum electronics, Fourier spectroscopy, diffraction catastrophes); physics education (use of microcomputers in teaching and labs); nuclear solid state physics (Mössbauer effect, perturbed angular correlation, positron annihilation studies of defects in solids); shock wave and high pressure physics (chemical and structural response of condensed materials to high dynamic pressures, time-resolved optical spectroscopy, shock and detonation wave propagation, chemical reactions, dynamic mechanical failure); surface and chemical physics (synchrotron SAFS, diamond films, molecular interactions with surfaces, reactive etching of surfaces, photoelectric and thermal emission microscopy); theory (quantum chaos, nonlinear dynamics, mesoscopic systems, phase transitions

and critical phenomena, quantum liquids, and gases, atomic and molecular physics, classical and quantum gravity, black hole thermodynamics, and low-temperature physics). These research groups offer graduate students the opportunity to pursue original investigations required for advanced degrees. Undergraduate physics majors are encouraged to participate in research through the special-project course (PHYSICS 499) and through part-time jobs that are sometimes available.

The department offers courses of study leading to the degrees of Bachelor of Science in Physics, Master of Science in Physics, and Doctor of Philosophy (Physics).

Astronomy courses at both the undergraduate and graduate levels are administered by the department. Instruction in astronomy is enhanced by the use of a 12-inch refractor at the Jewett Observatory, a Spitz planetarium, and faculty research at LIGO gravitational-wave observatory. Opportunities are available for students to collaborate with faculty to do research projects.

The Department of Physics and Astronomy is a major participant in the Materials Science Program and offers courses and research opportunities leading to advanced degrees in this interdisciplinary program.

Student Learning Outcomes

A student who has completed the undergraduate program in physics will be able to use scientific reasoning to form and test hypotheses; think independently and question dogma by acquiring, reproducing, and assessing information from a variety of sources; understand the important concepts in each of the four core areas of physics: mechanics, electricity and magnetism, modern and quantum physics, and thermal and statistical physics; design and conduct scientific experiments which test new ideas and theories; present concepts and results clearly, both orally and in writing; and be prepared for graduate study and/or careers in physics.

Transfer Students

Transfer students receive credit for equivalent courses taken elsewhere, but must meet the requirements for graduation listed.

Preparation for Graduate Study

Undergraduate students contemplating graduate work in physics should consider enrolling in PHYSICS 443, 521, 571, and additional math courses.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

PHYSICS - ASTROPHYSICS OPTION (121 HOURS)

The program of courses below is appropriate for students who have had a good experience with calculus in high school and wish to start physics in the first semester at WSU (even though the student may be placed in MATH 171, if their high school grades for the year course were B or better they can follow this schedule of study). Students who

have placed in MATH 172 can accelerate the math sequence. Students who have not had calculus in high school should defer PHYSICS 201 until they have completed MATH 171. Upon consultation with the departmental advisor, modifications can be made in the list of required courses to fit the needs of individual students. The schedule of studies below includes the additional lab credit required for graduation by the College of Arts and Sciences.

Certification Requirements

A student may certify as a Physics major after completing 30 credits (preferably including PHYSICS 201 and MATH 171) with a cumulative GPA of 2.0 or better.

Graduation Requirements

A research experience is required of all students as a PHYSICS 499 project; however, to gain valuable work experience outside the university, students are strongly encouraged to participate in an internship or research experience in industry or a government lab outside of WSU. The summer after the junior year is the most appropriate time for this experience. All students are required to submit an undergraduate thesis to a committee of two physics faculty members in the senior year. PHYSICS 490 will give credit for this effort. The student must earn a C (2.0) or better grade in each of the required physics courses.

First Year

<i>First Term</i>	<i>Hours</i>
CHEM 105 [PSCI]	4
ENGLISH 101 [WRTG]	3
MATH 171 [QUAN]	4
PHYSICS 188	1
Social Sciences [SSCI]	3

<i>Second Term</i>	<i>Hours</i>
CHEM 106 or 116	4
HISTORY 105 [ROOT]	3
MATH 172	4
PHYSICS 201	4

Second Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI]	3
MATH 220	2
MATH 273	2
PHYSICS 202	4
PHYSICS 303	3
Foreign Language, if necessary	0-4

<i>Second Term</i>	<i>Hours</i>
ASTRONOM 390	1
Creative and Professional Arts [ARTS]	3
MATH 315	3
PHYSICS 304	3
PHYSICS 330	3
Foreign Language, if necessary	0-4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
ASTRONOM 345	3
CPT S 121, E E 221, or MATH 300 [M]	2-4
Humanities [HUM]	3
MATH Elective ¹	3
PHYSICS 320	3
PHYSICS 341	3

<i>Second Term</i>	<i>Hours</i>
ASTRONOM 435 or 436	3
ENGLISH 402 [WRTG]	3
MATH Elective ¹	3
PHYSICS 342	3
PHYSICS 415 [M]	3
PHYSICS 499	1

Fourth Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
PHYSICS 410	3
PHYSICS 450	3
PHYSICS 490 [M]	1
Technical Elective ²	6

<i>Second Term</i>	<i>Hours</i>
ASTRONOM 435 or 436	3
Diversity [DIVR]	3
Integrative Capstone [CAPS]	3
Technical Elective ²	6

¹ MATH Electives (6 hours): Choose from 300-400-level MATH courses not used to fulfill other requirements.

² Technical Electives (12 hours, at least 6 must be 300-400 level): Choose from ASTRONOM, CHEM, MATH, or PHYSICS courses not used to fulfill other requirements.

PHYSICS - STANDARD OPTION (121 HOURS)

The program of courses below is appropriate for students who have had a good experience with calculus in high school and wish to start physics in the first semester at WSU (even though the student may be placed in MATH 171, if their high school grades for the year course were B or better they can follow this schedule of study). Students who have placed in MATH 172 can accelerate the math sequence. Students who have not had calculus in high school should defer PHYSICS 201 until they have completed MATH 171. Upon consultation with the departmental advisor, modifications can be made in the list of required courses to fit the needs of individual students. The schedule of studies below includes the additional lab credit required for graduation by the College of Arts and Sciences.

Certification Requirements

A student may certify as a physics major after completing 30 credits (preferably including PHYSICS 201 and MATH 171) with a cumulative GPA of 2.0 or better.

Graduation Requirements

A research experience is required of all students as a PHYSICS 499 project; however, to gain valuable work experience outside the university, students are strongly encouraged to participate in an internship or research experience in industry or a government lab outside of WSU. The summer after the junior year is the most appropriate time for this experience. All students are required to submit an undergraduate thesis to a committee of two physics faculty members in the senior year. PHYSICS 490 will give credit for this effort. The student must earn a C (2.0) or better grade in each of the required physics courses.

First Year

<i>First Term</i>	<i>Hours</i>
CHEM 105 [PSCI]	4
ENGLISH 101 [WRTG]	3
MATH 171 [QUAN]	4
PHYSICS 188	1
Social Sciences [SSCI]	3

<i>Second Term</i>	<i>Hours</i>
CHEM 106 or 116	4
HISTORY 105 [ROOT]	3
MATH 172	4
PHYSICS 201	4

Second Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI]	3
MATH 220	2
MATH 273	2
PHYSICS 202	4
PHYSICS 303	3
Foreign Language, if necessary	0-4

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
MATH 315	3
PHYSICS 304	3
PHYSICS 330	3
Foreign Language, if necessary	0-4
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
CPT S 121, E E 221, or MATH 300	2-4
Diversity [DIVR]	3
Humanities [HUM]	3
MATH Elective ¹	3
PHYSICS 320	3
PHYSICS 341	3

<i>Second Term</i>	<i>Hours</i>
ENGLISH 402 [WRTG] [M]	3
MATH Elective ¹	3
PHYSICS 342	3
PHYSICS 415 [M]	3
PHYSICS 499	1
Standard Option Elective ²	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
PHYSICS 410	3
PHYSICS 450	3
PHYSICS 490 [M]	1
Standard Option Elective ²	3
Technical Elective ³	3

<i>Second Term</i>	<i>Hours</i>
Integrative Capstone [CAPS]	3
Standard Option Elective	9
Technical Elective ³	4

¹ MATH Electives (6 hours): Choose from 300-400-level MATH courses not used to fulfill other requirements.

² Standard Option Electives (15 hours): Choose from 300-400-level ASTRONOM and PHYSICS courses not used to fulfill other requirements.

³ Technical Electives (7 hours, at least 4 must be 300-400 level): Choose from ASTRONOM, CHEM, MATH, or PHYSICS courses not used to fulfill other requirements.

Minors

Astronomy

An Astronomy minor requires ASTRONOM 345, 435 and 436; at least two hours from ASTRONOM 390, PHYSICS 490, or 499; and at least 3 hours from ASTRONOM 135, GEOLOGY 103, or HISTORY 381. The minor also requires MATH 273 and PHYSICS 303. These courses have as prerequisites MATH 171, 172, 220, and PHYSICS 201 and 202. These prerequisites are often required as part of physical science major programs (Chemistry, Computer Science, Engineering, Geology, and Physics) so that students in these fields will find the astronomy minor more accessible than students in other fields. Credit hours for the minor must include 9 hours of upper-division work taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Physics

A Physics minor requires PHYSICS 201, 202, 303, and 304 plus any two courses (6 credits) from the following list: PHYSICS 320, 330, 341, 342, 410, 415 [M], 443, 450, 461, 463, or 465. This makes a total of 20 credits in PHYSICS, of which 12 are upper division. Credit hours must include 9 hours of upper-division work taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. Students from outside the College of Arts and Sciences (i.e., College of Engineering) do not have to meet the extra graduation requirements of the College of Arts and Sciences.

Description of Courses

ASTRONOMY

ASTRONOM

- 135 [PSCI] Astronomy 4 (3-2)** Overview of the solar system, stars, galaxies, cosmology, and the history of astronomy. Includes a lab component with occasional evening meetings. Credit not granted for both ASTRONOM 135 and 150.
- 138 [PSCI] Planets and Planetary Systems 3** Formation and dynamics of planetary systems; major planets: interiors, surfaces, atmospheres; minor planets: moons, asteroids, comets; science missions; extrasolar planets.
- 150 [PSCI] Science and the Universe 3** Basic structure and history of science and science reasoning with emphasis on astronomy, observational practice, and data analysis. Credit not granted for both ASTRONOM 135 and 150.
- 345 Principles of Astronomy 3** Course Prerequisite: MATH 172 or 182; PHYSICS 202 or 206. Planets, the sun, stars, and galaxies; current topics in astrophysics and planetary research.

390 [PSCI] The Night Sky 1 (0-3) Course Prerequisite: Science [BSCI], [PSCI], or [SCI] UCORE. Star names, magnitude scales, constellation identification, astronomical coordinates, solar, lunar and planetary motions, practical astronomy. Some outdoor evening time required.

435 Astronomy and Astrophysics I 3 Course Prerequisite: MATH 172 or 182; PHYSICS 202 or 206. Planets, solar systems, and stars.

436 Astronomy and Astrophysics II 3 Course Prerequisite: MATH 172 or 182; PHYSICS 202 or 206. Exotic objects, galaxies, and cosmology.

450 [CAPS] Life in the Universe 3 Course Prerequisite: Mathematics [N] or [QUAN]; junior standing. The natural history of life on earth and prospects for life elsewhere; includes chemistry, biology, geology, physics and astronomy. Recommended preparation: Completion of physical and biological sciences GERS/UCORES.

581 Advanced Topics 3 May be repeated for credit; cumulative maximum 12 hours. Topics of current interest in advanced physics. (Crosslisted course offered as PHYSICS 581, ASTRONOM 581). Cooperative: Open to UI degree-seeking students.

PHYSICS

PHYSICS

101 [PSCI] General Physics 4 (3-3) Course Prerequisite: MATH 107 or 108 with a grade of C or better, a minimum ALEKS math placement score 75%, or passing MATH 140, 171, 202, or 206. Algebra/trigonometry-based physics; topics in mechanics, wave phenomena, temperature, and heat; oriented toward non-physical science majors. Credit not granted for more than one of PHYSICS 101, 201, or 205.

102 [PSCI] General Physics 4 (3-3) Course Prerequisite: PHYSICS 101 with a grade of C or better; MATH 107 or 108 with a grade of C or better, a minimum ALEKS math placement score 75%, or passing MATH 140, 171, 202, or 206. Algebra/trigonometry-based physics; topics in electricity, magnetism, optical phenomena, relativity, and quantum theory; oriented toward non-physical science majors. Credit not granted for more than one of PHYSICS 102, 202, or 206.

103 Problem Solving for Physics 101 1 Course Prerequisite: Concurrent enrollment in PHYSICS 101. Small class environment for students who desire focused attention on problem solving skills as applied to PHYSICS 101 materials. S, F grading.

104 Problem Solving for Physics 102 1 Course Prerequisite: Concurrent enrollment in PHYSICS 102. Small class environment for students who desire focused attention on problem solving skills as applied to PHYSICS 102 materials. S, F grading.

150 [PSCI] Physics and Your World 3 Survey of physics as found in everyday phenomena; including many hands-on activities and home experiments.

188 First-Year Seminar I 1 Faculty will present current research interests and opportunities in physics; questions and discussion. Taught annually each fall. S, F grading.

201 [PSCI] Physics for Scientists and Engineers I 4 (3-3) Course Prerequisite: MATH 171 with a C or better, MATH 172 or concurrent enrollment, MATH 182 or concurrent enrollment, MATH 273 or concurrent enrollment, or MATH 315 or concurrent enrollment. Calculus-based physics; topics in motion and dynamics of particles and rigid bodies, vibrations, wave phenomena, and the laws of thermodynamics. Credit not granted for more than one of PHYSICS 101, 201, or 205.

202 [PSCI] Physics for Scientists and Engineers II 4 (3-3) Course Prerequisite: PHYSICS 201 with a C or better or PHYSICS 205 with a C or better; MATH 172 with a C or better or MATH 182 with a C or better. Calculus-based physics, topics in electricity, magnetism, electromagnetics, D/C and A/C circuits, optics, reflection, refraction, interference, diffraction, polarization. Credit not granted for more than one of PHYSICS 102, 202, or 206.

203 Problem Solving for Physics 201 1 Course Prerequisite: Concurrent enrollment in PHYSICS 201. Small class environment for students who desire focused attention on problem solving skills as applied to PHYSICS 201 materials. S, F grading.

204 Problem Solving for Physics 202 1 Course Prerequisite: Concurrent enrollment in PHYSICS 202. Small class environment for students who desire focused attention on problem solving skills as applied to PHYSICS 202 materials. S, F grading.

205 [PSCI] Physics for Scientists and Engineers I - Honors 5 (3-5) Course Prerequisite: MATH 171 with a C or better, MATH 172 or concurrent enrollment, MATH 182 or concurrent enrollment, MATH 273 or concurrent enrollment, or MATH 315 or concurrent enrollment. Calculus-based physics, honors section; mechanics, sound, and thermodynamics. Credit not granted for more than one of PHYSICS 101, 201, or 205.

206 [PSCI] Physics for Scientists and Engineers II - Honors 5 (3-5) Course Prerequisite: PHYSICS 201 with a C or better or PHYSICS 205 with a C or better; MATH 172 with a C or better or MATH 182 with a C or better. Calculus-based physics, honors section; electricity, magnetism, light, topics in modern physics. Credit not granted for more than one of PHYSICS 102, 202, or 206.

303 Modern Physics I 3 Course Prerequisite: MATH 220 or concurrent enrollment or MATH 230 or concurrent enrollment; PHYSICS 202 or concurrent enrollment or PHYSICS 206 or concurrent enrollment. Quantum and relativity theories with applications to atomic, solid state, nuclear and elementary particle physics.

304 Modern Physics II 3 Course Prerequisite: PHYSICS 303. Continuation of PHYSICS 303.

- 320 Mechanics 3** Course Prerequisite: MATH 315 or concurrent enrollment; MATH 220 or concurrent enrollment or MATH 230 or concurrent enrollment; PHYSICS 202 or 206. Particle motion in one-, two-, and three-dimensions; motions of systems of particles; rigid body motion; Lagrange's equations.
- 330 Thermal Physics 3** Course Prerequisite: MATH 273 or 283; PHYSICS 202 or 206. Thermal behavior of systems; energy and entropy; equations of state; changes of phase; elements of continuum and statistical approaches.
- 341 Electricity and Magnetism I 3** Course Prerequisite: MATH 315 or concurrent enrollment; PHYSICS 202 or 206. Electrostatic fields, magnetic fields, dielectric and magnetic media.
- 342 Electricity and Magnetism II 3** Course Prerequisite: PHYSICS 341. Continuation of PHYSICS 341. Maxwell's equations; electromagnetic waves, special relativity.
- 408 [CAPS] Physics and Society 3** Course Prerequisite: Junior standing. Interactions of physics with society; energy; air and water pollution; recycling; communications and computers; physics and war; physics and art.
- 410 Electronics 3 (1-6)** Course Prerequisite: PHYSICS 202 or 206. Laboratory construction and investigation of electronic circuits employed in research instruments.
- 415 [M] Quantum Physics Laboratory 3 (2-3)** May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: PHYSICS 304. Experiments in modern and quantum physics, fundamental interactions of radiations with matter.
- 443 Optics 3** Course Prerequisite: PHYSICS 341 or concurrent enrollment. Polarization, interference, coherence, and diffraction phenomena of the electromagnetic spectrum; optics of solids; laser resonators; gaussian beams; ABCD matrices.
- 450 Introduction to Quantum Mechanics 3** Course Prerequisite: MATH 315; PHYSICS 303. Introduction to quantum theory with applications to atomic physics. Cooperative: Open to UI degree-seeking students.
- 461 Introduction to Atomic and Molecular Physics 3** Course Prerequisite: PHYSICS 304. Introduction to atomic and molecular physics; spectroscopy.
- 463 Introduction to Solid State and Materials Physics 3** Course Prerequisite: PHYSICS 304. Introduction to the physics of solids; crystal structures, lattice vibrations, and electron theory. Cooperative: Open to UI degree-seeking students.
- 465 Introductory Nuclear Physics 3** Course Prerequisite: PHYSICS 304. Nuclear systematics, apparatus of nuclear research, radioactivity, nuclear-atomic interactions, nuclear reactions and scattering; introductory particle physics. Cooperative: Open to UI degree-seeking students.
- 466 Biological Physics 3** Course Prerequisite: CHEM 106 or 116; MATH 172 or 182; PHYSICS 202 or 206. Fundamental physics and thermodynamics of the cell; mechanics of biomolecular machines. Credit not granted for both PHYSICS 466 and PHYSICS 566.
- 481 Advanced Topics V 1-3** May be repeated for credit; cumulative maximum 6 hours. Topics in scientific and technological areas that have relative significance to physics and astronomy.
- 490 [M] Undergraduate Thesis 1** Preliminary thesis draft of a laboratory or library research experience, oral presentation, and final draft.
- 499 Special Problems V 1-4** May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 501 Graduate Seminar 1** Introduction to graduate and interdisciplinary research. S, F grading.
- 514 Optoelectronics Lab I 1 (0-3)** May be repeated for credit; cumulative maximum 3 hours. Experiments with optical systems: Imaging, interference, coherence, information storage/processing, gas and solid state lasers, optical fibers, and communications systems.
- 515 Optoelectronics Lab II V 1 (0-3) to 3 (0-9)** May be repeated for credit; cumulative maximum 3 hours. Experiments in optical physics, physical properties of light, laser physics, waveguides, quantum confined semiconductor structures and ultrafast dynamics and nonlinear optics.
- 521 Classical Mechanics I 3** Laws of motion as developed by Newton, d'Alembert, Lagrange, and Hamilton; dynamics of particles and rigid bodies. Cooperative: Open to UI degree-seeking students.
- 522 Classical Mechanics II 3** Continuation of PHYSICS 521. Classical mechanics of liquids and deformable solids; stress, deformation and strain, flow, oscillations and waves.
- 533 Thermal and Statistical Physics I 3** Thermodynamic laws and potentials, kinetic theory, hydrodynamics and transport coefficients; introduction to statistical mechanics, ensembles, partition functions.
- 534 Thermal and Statistical Physics II 3** Phase transitions and critical phenomena, Ginzburg-Landau theory, Bose-Einstein condensation, superfluids, Fermi systems, low-temperature expansions. Cooperative: Open to UI degree-seeking students.
- 541 Electromagnetic Theory 3** Special relativity and the classical electromagnetic field; emission, propagation, and absorption of electromagnetic waves. Cooperative: Open to UI degree-seeking students.
- 542 Electrodynamics 3** Interaction of matter and electromagnetic radiation; classical and quantum electrodynamics. Cooperative: Open to UI degree-seeking students.
- 545 Nonlinear Optics 3** Nonlinear wave propagation theory applied to several nonlinear-optical phenomena; experimental techniques that probe a material's nonlinearity.
- 546 Quantum Electronics 3** The physics of lasers and of coherent optical radiation generation and propagation.
- 550 Quantum Theory I 3** Introduction to quantum theory; physical and mathematical foundations; application to atomic systems. Cooperative: Open to UI degree-seeking students.
- 551 Quantum Theory II 3** Symmetry and invariance; angular momentum theory; approximation methods. Cooperative: Open to UI degree-seeking students.
- 552 Quantum Theory III 3** Scattering theory; relativistic wave mechanics; quantum field theory. Cooperative: Open to UI degree-seeking students.
- 561 Atomic and Molecular Physics 3** Physics of atoms and molecules using quantum theory. Cooperative: Open to UI degree-seeking students.
- 563 Physics of the Solid State 3** Lattice vibrations and defects; ionic and electronic conductivities; band theory; magnetic properties; luminescence. Cooperative: Open to UI degree-seeking students.
- 566 Biological Physics 3** Fundamental physics and thermodynamics of the cell; mechanics of biomolecular machines. Credit not granted for both PHYSICS 466 and PHYSICS 566.
- 571 Methods of Theoretical Physics 3** Mathematical methods for theoretical physics; linear algebra, tensor analysis, complex variables, differential equations, integral equations, variational calculus, and group theory. Cooperative: Open to UI degree-seeking students.
- 575 Advanced Solid State Physics 3** Quantum theory of solids; Green's functions, correlation functions and other field-theoretic methods; magnetism, superconductivity and transport properties.
- 581 Advanced Topics 3** May be repeated for credit; cumulative maximum 12 hours. Topics of current interest in advanced physics. (Crosslisted course offered as PHYSICS 581, ASTRONOM 581). Cooperative: Open to UI degree-seeking students.
- 590 Seminar 1** May be repeated for credit. S, F grading.
- 592 Wave Propagation Seminar 2** May be repeated for credit; cumulative maximum 4 hours. Waves in the continuum; elastic, plastic, and hydrodynamic waves; shock waves. S, F grading.
- 598 Teaching Undergraduate Physics Laboratories 1** May be repeated for credit; cumulative maximum 4 hours. Principles and practices of teaching, planning and management of undergraduate physics laboratories; choice and care of equipment. S, F grading.

600 Special Projects or Independent Study V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.

700 Master's Research, Thesis, and/or Examination V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

702 Master's Special Problems, Directed Study and/or Examination V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Physics PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Department of Plant Pathology

plantpath.wsu.edu
Johnson Hall 345
509-335-9541

Professor and Chair, S. H. Hulbert; Professors, L. M. Carris, G. A. Chastagner, L. J. duToit, G. G. Grove, L. A. Hadwiger, D. A. Inglis, D. A. Johnson, J. W. Moyer, T. D. Murray, H. R. Pappu; Associate Professors, T. L. Peever, N. Rayapati; Assistant Professors, A. Amiri, C. Gleason, K. Tanaka; Adjunct ARS Plant Pathologists, W. Chen, X. M. Chen, F. M. Dugan, N. Klopfenstein, M. Mazzola, R. Navarre, P. A. Okubara, T. C. Paulitz, L. Porter, D. See, L. S. Thomashow, G. Vandemark, D. M. Weller, C. L. Xiao, L-X Yu; Adjunct Plant Pathologist, G. Bangera; Professors Emeriti, R. J. Cook, K. C. Eastwell, J. D. Rogers, S. H. Smith.

Plant pathology is the study of plant diseases, including causes, economic consequences, spread, and control. Opportunities for graduates in plant pathology include positions in research and development, teaching, extension, diagnostics, and sales. Plant pathologists are employed throughout the world by industries, governments, educational institutions, and private foundations.

Most opportunities in plant pathology require

advanced degrees. Students who intend to terminate university training with a baccalaureate degree are encouraged to enroll in the Agricultural and Food Systems (Agriculture and Food Security major) or Integrated Plant Sciences curricula. For more information on these baccalaureate degrees, please visit <http://academic.cahnrs.wsu.edu/majors>.

The courses offered in this department are designed both to train students expecting to make plant pathology their professional field of specialization and to provide supplementary training for students in other biological and agricultural fields, particularly botany, crop science, genetics, horticulture, forestry, and entomology. Students who expect to become professional plant pathologists are advised to include in their undergraduate studies fundamental courses in botany, chemistry, genetics, microbiology, physics, and zoology.

A professional career in plant pathology would benefit from graduate training. Students often enter the graduate program in plant pathology following a major in biology, botany, crop science, genetics, horticulture, molecular biology, or similar areas as well as in plant pathology. Specialized areas of advanced study include bacteriology, mycology, nematology, virology, epidemiology, molecular biology of host-parasite relationships, ecology of disease development, disease resistance, chemical control, and biological control. Research is conducted on diseases of grain crops, forage crops, forest trees, tree fruits, grapes, vegetables, ornamentals, and turf.

The department offers Master of Science in Plant Pathology, and Doctor of Philosophy in Plant Pathology and contributes to the degrees of Bachelor of Science in Agricultural and Food Systems, Bachelor of Science in Integrated Plant Sciences, and the Master of Science in Agriculture online degree.

Preparation for Graduate Study

As preparation for work toward an advanced degree, a student should have completed a bachelor's degree; at least one semester each of general inorganic chemistry, botany, zoology, physics; one semester each of systematic botany, plant physiology, general plant pathology, entomology, microbiology, precalculus, organic chemistry, genetics, and report writing or advanced composition.

Student Learning Outcomes

To enable students earning the M.S. and Ph.D. in Plant Pathology to understand and apply the scientific method to plant pathological problems, to develop critical thinking and professional skills needed for successful careers in public and private sectors, the program provides training and coursework to help students develop the following skills:

- Understanding, interpretation and synthesis of scientific literature pertaining to plant pathology and related disciplines.
- Formulating hypotheses; developing experimental designs to test these hypotheses; establishing and maintaining experiments.
- Collecting data in an objective way and conducting appropriate statistical analyses.
- Interpretation and presentation of research results in oral and written formats.
- Presentation of research at professional meetings and local commodity meetings.

- Publication of research in peer-reviewed scientific journals and other discipline-appropriate outlets such as commodity newsletters.

To maintain a leadership role in plant pathology and related disciplines at the state, national and international levels, the program aims to:

- Attract, retain and train high quality graduate students.
- Place students earning the M.S. into positions including extension agents, state and federal plant pathologists, instructors at the community college level, support scientists in public or private sector research programs, and PhD programs.
- Place students earning the Ph.D. as leaders of scientific research programs in the public or private sector including industry, and faculty positions at the University level.

Description of Courses

PLANT PATHOLOGY

PL P

150 [BSCI] Molds, Mildews, Mushrooms: The Fifth Kingdom 3 A survey of the socio-historical impact of fungi and their role in development and application of the scientific method.

300 Diseases of Fruit Crops 2 Course Prerequisite: BIOLOGY 120, HORT 310, or HORT 313. Comprehensive understanding of the diseases of fruit crops grown in the state of Washington.

301 Food Mycology 3 (2-3) Course Prerequisite: MBIOS 101. Survey of the biology and uses of fungi important in the production and storage of foods and beverages. (Crosslisted course offered as PL P 301, FS 301).

403 Advanced Cropping Systems 3 Course Prerequisite: HORT 202. Understanding the management of constraints to crop production and quality; biological, physical, and chemical approaches to crop health management. Field trips required. (Crosslisted course offered as CROP SCI 403, PL P 403). Recommended preparation: CROP SCI 305; PL P 429. Cooperative: Open to UI degree-seeking students.

429 General Plant Pathology 3 (2-3) Classification, symptoms, causes, epidemiology, and control of plant diseases.

499 Special Problems V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.

501 Biology and Control of Plant Diseases 3 (2-3) Introduction to the biology and control of plant diseases covering disorders caused by fungi, viruses, bacteria, and nematodes.

503 Advanced Cropping Systems 3 Understanding the management of constraints to crop production and quality; biological, physical, and chemical approaches to crop health management. Field trips required. (Crosslisted course offered as CROP SCI 403, PL P 403). Recommended preparation: CROP SCI 305; PL P 429. Cooperative: Open to UI degree-seeking students.

511 Viruses and Virus Diseases of Plants 4 (3-3) Course Prerequisite: MBIOS 503 or 504. Nature of plant viruses, vector-virus relationships and virus diseases of plants. Cooperative: Open to UI degree-seeking students.

512 Topics in Plant Pathology V 1-3 May be repeated for credit; cumulative maximum 6 hours. Concepts of plant pathogen interactions and disease management.

513 Plant Nematology 3 Anatomy and morphology of plant-parasitic nematodes, molecular plant-nematode interactions, genomics, symptoms, identification, techniques and control. Cooperative: Open to UI degree-seeking students.

514 Phytobacteriology 3 Isolation and characterization of bacteria having a saprophytic, symbiotic or pathogenic association with plants, molecular structure, function, and genetics. Cooperative: Open to UI degree-seeking students.

515 Seminar 1 May be repeated for credit.

521 General Mycology 3 The structure, life histories, classification, and economic importance of the fungi. Cooperative: Open to UI degree-seeking students.

525 Field Plant Pathology and Mycology 3 Diverse plant diseases, disease diagnosis and management in fields, orchards, nurseries; interact directly with diverse agricultural stakeholders. Field trip required. Recommended preparation: PL P 429 or PL P 521.

526 Advanced Fungal Biology 4 (2-6) Advanced topics in fungal biology, ecology, systematics, evolution and coevolution via discussions of literature and special laboratory projects. Recommended preparation: Introductory mycology and genetics coursework. Cooperative: Open to UI degree-seeking students.

535 Molecular Genetics of Plant and Pathogen Interactions 3 Genetic and molecular biological aspects of host-pathogen interactions. Cooperative: Open to UI degree-seeking students.

551 Epidemiology and Management of Plant Diseases 3 Principles of plant disease epidemiology, control and ecology of pathogens. Recommended preparation: PL P 429. Cooperative: Open to UI degree-seeking students.

570 Techniques in Plant Pathology 3 (1-6) Laboratory techniques for isolating, cultivating, and identifying the major groups of plant pathogenic organisms. Cooperative: Open to UI degree-seeking students.

700 Master's Research, Thesis, and/or Examination V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Plant Pathology PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

School of Politics, Philosophy, and Public Affairs

Johnson Twr 801
509-335-2544

POLITICAL SCIENCE: Professors, C. Clayton, M. Cottam, A. Mazur, T. Preston, T. Ridout; Associate Professors, D. Baker, C. Long, S. Stehr, M. Stephan, P. Thiers; Assistant Professors, C. Leeb, A. Lopez, M. Salamone, A. Townsen; Professors Emeriti, N. Lovrich, D. Nice. PHILOSOPHY: Director and Professor, P. Glazebrook; Professors, J. K. Campbell, M. W. Myers; Associate Professors, D. L. Shier, M. Stichter; Assistant Professor, M. Goldsby. Clinical Associate Professors, W. Kabasheche, N. Nicol; Professors Emeriti, D. M. Holbrook, H. S. Silverstein. PUBLIC AFFAIRS: Professor and Academic Director, A. Wharton; Associate Professor and Program Director, P. Thiers; Professors, C. Mosher, T. Tripp; Associate Professors, D. Baker, L. Drapela, S. Finley, C. Long, A. Maclean, M. Stephan, D. Wood; Assistant Professor, A. Lopez.

POLITICAL SCIENCE PROGRAM

<http://libarts.wsu.edu/pppa/undergraduate/major-ps.asp>

Courses in political science are offered in political institutions (presidency, congress, the courts, political parties, mass media), public policy formation and evaluation, public law, civil liberties, international relations (foreign policy, security studies, conflict resolution), comparative government (area studies, post-industrial societies, cross-national comparisons), political philosophy and methodology.

The School of Politics, Philosophy, and Public Affairs (PPPA) offers courses of study leading to the degrees of Bachelor of Arts in Political Science, Master of Arts in Political Science (with a Graduate Certificate in Global Justice and Security Studies), and Doctor of Philosophy.

The undergraduate programs in Political Science are designed to prepare students to be more thoughtful consumers and producers of information

related to political phenomenon in the U.S. and in other nations.

Student Learning Outcomes

More specifically, the school's programs teach students to:

- Identify important issues and challenges in political science and work to solve them;
- Recognize, construct, and evaluate arguments, and employ cogent arguments on relevant issues;
- Use evidence in the context of research and learn the methodologies of political science;
- Recognize and respond to alternative, diverse viewpoints, and understand the role of values and normative reasoning in relevant contexts.

Options within the B.A. in Political Science: General Option, Prelaw Option, and Global Politics Option

General: The General Option in the Political Science B.A. provides diverse training in American politics, comparative and international politics, policy and public administration, and a wide range of elective courses in political science.

No specific major is required to be eligible for law school but political science is widely recognized as an excellent academic preparation for law school. The CAS Prelaw Advising Center assists all students interested in law school regardless of their intended major.

Pre-Law: The Political Science Prelaw Option is designed to prepare students for law school and eventual careers in law. This curriculum reflects recommendations of the Association of American Law Schools.

Global Politics: This option emphasizes comparative and international politics and includes an international experience that can be fulfilled through study abroad, an international internship, a minor in a foreign language or global studies, or ROTC.

Government is the nation's largest employer. Many public officials are political science graduates. The school advises students concerning training and career opportunities in federal, state, and local governments, the Foreign Service, and related occupations. Its internship programs place students in public agencies, political parties, and similar organizations. The school also encourages and advises students on study abroad as part of preparing for careers in international affairs.

Preparation for Graduate Study

<http://libarts.wsu.edu/pppa/graduate/index.asp>

Students with some undergraduate course work in political science while majoring in such subjects as economics, business administration, history, criminal justice or sociology may readily pursue graduate study in political science. Undergraduates at other institutions or in other programs at this institution who contemplate graduate work in this program should acquire some training in political science. For graduate study and its graduate degree programs, our students currently choose from one major foundational training area within which they will focus for their preliminary exams (Institutions and Processes; Behavior and Psychology; Theory and Philosophy), as well as a specialization field (American politics; Global politics; Public Policy/Public Administration).

PHILOSOPHY PROGRAM

<http://libarts.wsu.edu/pppa/undergraduate/major-ph.asp>

The Philosophy program in the School of Politics, Philosophy, and Public Affairs offers courses in which students discuss fundamental intellectual questions and both classical and contemporary attempts to address them. What makes for a morally right act or a just society? What sorts of things can we really claim to know? What is mind, and what is its relation to matter? Are we really capable of free choice or is our every act determined by past events? These are the kinds of questions that are addressed by philosophers.

Philosophy students acquire knowledge of ethics, logic, political philosophy, philosophy of religion, epistemology, metaphysics, and other areas that provide excellent intellectual foundations for careers in law, government service, education, ministry, and many other fields. This is reflected in the fact that philosophy majors, on average, perform better than any other major on professional and graduate school admission tests that are required for admission to law school, medical school, business administration programs, and graduate school.

The study of philosophy enables students to explore critically a variety of systems of beliefs and values, to identify and challenge the foundations of their own beliefs and values, and to develop critical thinking and communication skills that are in high demand and central to success in all professions.

The School of Politics, Philosophy, and Public Affairs offers programs of study leading to the Bachelor of Arts in Philosophy (in either the General Option or the Pre-Law Option) and the Graduate Certificate in Bioethics.

Student Learning Outcomes

More specifically, the school's programs teach students to:

- Identify important issues and challenges in philosophy and work to solve them;
- Recognize, construct, and evaluate arguments, and employ cogent arguments on relevant issues;
- Use evidence in the context of research and learn the methodologies of philosophy;
- Recognize and respond to alternative, diverse viewpoints, and understand the role of values and normative reasoning in relevant contexts.

Options within the B.A. in Philosophy: General Option and Prelaw Option

General: The General Option provides broad training in philosophy, including an emphasis on the history of philosophical thought.

Pre-Law: The Philosophy Pre-Law Option is designed to prepare students for law school and eventual careers in law. This curriculum emphasizes ethics, political philosophy, and critical thinking, and it reflects recommendations of the Association of American Law Schools. Students choosing other school options are also eligible to attend law school if they meet admission requirements, but philosophy is widely recognized as an excellent academic preparation for law school.

PUBLIC AFFAIRS

<http://cas.vancouver.wsu.edu/public-affairs>

Public Affairs Degrees are offered at the undergraduate and graduate level exclusively on

the WSU Vancouver Campus. The Bachelor of Arts in Public Affairs (BAPA) seeks to develop critical thinking about political and social values and develop the ability to conduct objective analysis of public infrastructures and bureaucratic processes. The degree program is designed to educate people for service in public and nonprofit agencies and to prepare students for graduate or law school. In addition to core courses, students complete a concentration in public policy and politics, public administration and management, or justice studies. The program's multidisciplinary perspective provides for the blending of theory, methodology, and experience in an academically rigorous degree format.

The Master's Degree in Public Affairs (MPA) draws on a wide variety of academic disciplines, including political science, sociology, business administration, economics, health policy administration, environmental science/regional planning and criminal justice. This degree program is designed for the education of individuals interested in administrative and leadership positions in the public sector. In addition to core coursework, students complete a concentration in public administration, applied policy studies, health policy and public service, justice studies, or environmental policy.

The MPA prepares students for a diverse variety of employment opportunities ranging from local government and public policy analysis to personnel administration and strategic planning. The degree also prepared students for a range of jobs outside of government service, such as those in nonprofit organizations. MPA students may already be employed in these areas and be seeking this degree to advance professionally in the field; these students can expect to hone their skills and receive further training. Alternatively, the Master of Public Affairs degree is also appropriate for students who would like to shift their career tracks and obtain a position in the public and nonprofit sector.

Student Learning Outcomes

Studying Public Affairs enables students to become ethical, engaged and competent professionals, in public administration, public management and public policy. Graduates from our programs are well prepared for careers in public service at the local, state, national or global levels, or for pursuing further studies. The program offers an intersection between rigorous academic research and practical application. Our goal is to foster evidence-based reasoning and practice on the part of those working for the public good, including students, community members, legislators, practitioners, scholars, and issue stakeholders.

Students in public affairs are expected to demonstrate learned capacity in the universally required competencies of the Network of Schools of Public Policy, Affairs, and Administration (NASPAA) as appropriate for the student's level of study (i.e. undergraduate or graduate). NASPAA's universal required competencies include the following:

- To lead and manage in public governance;
- To participate in and contribute to the policy process;
- To analyze, synthesize, think critically, solve problems and make decisions;
- To articulate and apply a public service perspective; and
- To communicate and interact productively with a diverse and changing workforce and citizenry.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

PHILOSOPHY - GENERAL OPTION (120 HOURS)

No course with a grade of D+ or less and no course taken pass/fail will be counted toward the major. The overall GPA for courses in the major must be at least a 2.00.

First Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
HISTORY 105 [ROOT]	3
PHIL 101 [HUM] or 103 [HUM]	3
Electives	6

<i>Second Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
ENGLISH 101 [WRTG]	3
PHIL 201 [QUAN]	3
Social Sciences [SSCI]	3
Electives	3

Second Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
Foreign Language, if necessary, or Elective	4
PHIL 207, 280, 314 [M], 315 [M], or 407 ²	3
Electives	2

<i>Second Term</i>	<i>Hours</i>
Foreign Language, if necessary, or Elective	4
PHIL 200 or 401	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4
Electives	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
Diversity [DIVR]	3
PHIL 320, 321, 322 or 421 (Select two - must include 320 and /or 321)	6
PHIL 360, 365, 370, 460 [M], or 462 [M] ²	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
Integrative Capstone [CAPS]	3
PHIL 350, 442 [M] or 443, 446, or 447 (Select two) ²	6
Electives	6

Fourth Year

<i>First Term</i>	<i>Hours</i>
PHIL 420, 425, 470, or 472 [M] ²	3
PHIL Electives ²	3
300-400-level Electives	3
Electives	6

<i>Second Term</i>	<i>Hours</i>
PHIL Electives ²	3

300-400-level Electives 12

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² PHIL electives may need to include 300-400-level courses and [M] courses to fulfill University requirements.

PHILOSOPHY - PRE-LAW OPTION (120 HOURS)

No course with a grade of D+ or less and no course taken pass/fail will be counted toward the major. The overall GPA for courses in the major must be at least a 2.00.

First Year

<i>First Term</i>	<i>Hours</i>
ENGLISH 101 [WRTG]	3
PHIL 101 [HUM] or 103 [HUM]	3
Social Sciences [SSCI]	3
Electives	6

<i>Second Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
HISTORY 105 [ROOT]	3
PHIL 201 [QUAN]	3
Electives	6

Second Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
PHIL 200	3
Foreign Language, if necessary, and/or Electives	6

<i>Second Term</i>	<i>Hours</i>
PHIL Elective ²	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4
Foreign Language, if necessary, and/or Electives	7
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
Diversity [DIVR]	3
PHIL 350, 442 [M], 443, 446, or 447 ²	3
PHIL 360, 365, 370, 460 [M], or 462 [M] ²	3
POL S 300	3

<i>Second Term</i>	<i>Hours</i>
Integrative Capstone [CAPS]	3
PHIL 360, 365, 370, 460 [M], or 462 [M] ²	3
300-400-level Electives	9

Fourth Year

<i>First Term</i>	<i>Hours</i>
PHIL 420, 425, 472 [M], or POL S 402 ²	3

PHIL 470	3
300-400-level Electives	9

<i>Second Term</i>	<i>Hours</i>
PHIL 360, 365, 370, 460 [M], or 462 [M] ²	3
PHIL Electives ²	3
300-400-level Electives	9

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² PHIL electives may need to include [M] courses to fulfill University requirements.

POLITICAL SCIENCE - GENERAL OPTION (120 HOURS)

36 Hours in POL S are required, at least 15 of which must be earned at WSU.

First Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
HISTORY 105 [ROOT]	3
Humanities [HUM]	3
POL S 101 [SSCI]	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
Diversity [DIVR]	3
ENGLISH 101 [WRTG]	3
POL S 102	3
Quantitative Reasoning [QUAN]	3
Electives	3

Second Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
Creative & Professional Arts [ARTS]	3
Electives	3
Foreign Language, if necessary, or Elective	3 or 4
POL S 103	3

<i>Second Term</i>	<i>Hours</i>
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4
POL S 201	3
Foreign Language, if necessary, and/or Electives	7
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
300-400-level Creative & Professional Arts, Humanities, or Social Sciences Elective	3
POL S Electives ²	9
300-400-level Electives	3

<i>Second Term</i>	<i>Hours</i>
300-400-level Creative & Professional Arts, Humanities, or Social Sciences Elective	3
ENGLISH 201 [WRTG], 301 [WRTG], or 402 [WRTG] [M]	3

POL S Elective ²	6
Elective (CPT S or STAT recommended)	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
300-400-level Creative & Professional Arts, Humanities, or Social Sciences Elective	3
300-400-level POL S Elective ²	3
300-400-level Electives	9

<i>Second Term</i>	<i>Hours</i>
300-400-level Creative & Professional Arts, Humanities, or Social Sciences Elective	3
300-400-level POL S Elective ²	6
Integrative Capstone [CAPS]	3
300-400-level Electives	3

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² POL S Electives may need to include [M] courses to fulfill University requirements.

POLITICAL SCIENCE - GLOBAL POLITICS OPTION (120 HOURS)

36 hours in POL S are required, at least 15 of which must be earned at WSU. Consult advisor on International Experience requirement.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
HISTORY 105 [ROOT]	3
Humanities [HUM]	3
POL S 101 [SSCI]	3
Quantitative Reasoning [QUAN]	3 or 4

<i>Second Term</i>	<i>Hours</i>
Diversity [DIVR]	3
ENGLISH 101 [WRTG]	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4
POL S 102	3
Electives	3

Second Year

<i>First Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
Creative & Professional Arts [ARTS]	3
POL S 103	3
Electives	4

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
Minor Field Elective	3
POL S 201	3
POL S Elective ²	3
Electives	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
300-400-level POL S Electives ²	6
Minor Field Elective or Foreign Language, if applicable	3 or 4
POL S Global Courses ³	6
<i>Second Term</i>	<i>Hours</i>
300-400-level POL S Electives ²	6
Minor Field Elective or Foreign Language, if applicable	3 or 4
Electives	6

Fourth Year

<i>First Term</i>	<i>Hours</i>
Integrative Capstone [CAPS]	3
Minor Field Elective, if applicable, or Elective	3
POL S 427	3
300-400-level Electives	6
<i>Second Term</i>	<i>Hours</i>
International Experience ⁴	3
300-400-level Electives, including Minor Field, if applicable	12

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² POL S Electives may need to include [M] courses to fulfill University requirements.

³ POL S Global Courses: Choose from POL S 305, 314, 405 [M], 418, 424 [M], 428, 429, 432 [M], 435, 447 [M], 472 [M], 474, 475, or 476 [M].

⁴ International Experience: Earn at least 3 credit hours while completing one of the following: a) Study abroad (at a WSU-approved program); b) International internship (POL S 497 approved by POL S advisor; either abroad or in U.S.-based internship that includes global activities); c) Minor in foreign languages or Global Studies; or d) Military Science (MIL SCI 402 while enrolled in ROTC).

POLITICAL SCIENCE - PRE-LAW OPTION (120 HOURS)

30 hours in POL S and 18 hours in other disciplines required. 15 of the 30 hours of POL S course work must be earned at WSU.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
HISTORY 105 [ROOT]	3
Humanities [HUM]	3
POL S 101 [SSCI]	3
Quantitative Reasoning [QUAN]	3
<i>Second Term</i>	<i>Hours</i>
ECONS 101 [SSCI] or ECONS 102 [SSCI]	3
ENGLISH 101 [WRTG]	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4
POL S 102	3
Electives	3

Second Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
CRM J 101 (recommended) or Elective	3
PHIL 201	3
POL S 103	3
Electives	3
<i>Second Term</i>	<i>Hours</i>
ENGLISH 201 [WRTG], ENGLISH 301 [WRTG], or PHIL 200 [WRTG]	3
H D 205 [COMM] or COM 102 [COMM]	3 or 4
POL S 201	3
POL S 300	3
Electives	3
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
300-400-level POL S Elective ²	3
CRM J 320 or 420 [M]	3
POL S 402	3
Foreign Language, if necessary, and/or Electives	5

<i>Second Term</i>	<i>Hours</i>
300-400-level POL S Elective ²	3
POL S 404 [M]	3
Foreign Language, if necessary, and/or Electives	9

Fourth Year

<i>First Term</i>	<i>Hours</i>
300-400-level POL S Elective ²	3
Diversity [DIVR]	3
300-400-level Electives	9
<i>Second Term</i>	<i>Hours</i>
Integrative Capstone [CAPS]	3
PHIL 470	3
300-400-level Electives	8

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² POL S Electives may need to include an additional [M] course to fulfill University requirements.

PUBLIC AFFAIRS (VANCOUVER ONLY) (120 HOURS)

The Bachelor of Arts in Public Affairs requires students to earn at least a C grade or higher in all core courses and no core courses may be taken pass/fail. In addition, only 6 hours in the concentration may be taken pass/fail. At least 40 of the 120 hours for the degree must be at the 300-400-level.

Certification Requirements

To certify in Public Affairs, students must have least 24 semester hours and an overall minimum GPA of 2.75 or higher. Once certified, all students must maintain a minimum overall GPA of 2.75 or higher or they will be decertified.

First Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
ENGLISH 101 [WRTG]	3
Foreign Language, if necessary, or Elective	3
Humanities [HUM]	3
POL S 101 [SSCI]	3

<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
Foreign Language, if necessary, or Elective	3
HISTORY 105 [ROOT]	3
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4
Quantitative Reasoning [QUAN]	3

Second Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
POL S 300	3
POL S 316	3
Electives	6

<i>Second Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
Diversity [DIVR]	3
POL S 340	3
Electives	7
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
Minor Elective ²	3
PA Elective ³	6
SOC 320	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
PA Elective ³	6
POL S 432 [M]	3
SOC 321	4
Electives	2

Fourth Year

<i>First Term</i>	<i>Hours</i>
Integrative Capstone [CAPS]	3
Minor Elective ²	6
PA Elective ³	3
POL S 442 [M]	3

<i>Second Term</i>	<i>Hours</i>
Minor Elective ²	9
300-400-level Electives	3

¹ To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² A minor is recommended, but not required. The minor must total 16 to 18 semester hours, including at least six credits of upper-division course work, and must be in an area other than criminal justice or political science.

³ PA Electives – 15 semester hours required in one of three concentration options: 1) Justice Studies: Two courses from CRM J 320, 330, and POL S 402; one course from SOC 360, 361, 362, and 367; and two courses from CRM J 370, 400 [M], 403, 420 [M], 424, 426, 428, 450 [M], 490, POL S 381, 404 [M], 405, SOC 340, and 461; 2) Public Administration & Management: Two courses from POL S 443, 445, and 446; three courses from HISTORY 415, 418, POL S 305, 400, 447 [M], 450 [M], 497 (Washington State Legislative Internship only), and SOC 343; or 3) Public Policy & Politics: Two courses from POL S 416, 417, 420, and 497 (Washington State Legislative Internship only); three courses from HISTORY 409, 415, 418, 419, POL S 305, 314, 317, 400, 404 [M], 410, 427, 430, 436, 448, 450 [M], 455, 497, SOC 332, 340, and 384.

Minors

Ethics

The minor in ethics consists of 18 credit hours, of which at least 15 must be from ethics courses within the department of philosophy, such as PHIL 360, 365, 370, 460 [M], 462, 470, and 472 [M]. Three credit hours may, with approval of the department of philosophy, be from an ethics course in the student's major or in another department. Nine of the 18 hours must be in upper-division work and taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Philosophy

The minor in philosophy consists of 18 hours of course work, at least 9 of which must be in 300-400-level courses taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. Courses are chosen by the student, in consultation with the department, but will normally include PHIL 101 or 103 and will always include PHIL 201.

Political Science

18 semester hours of political science coursework is required for the minor, 9 of which must be 300-400-level courses. Students must successfully complete POL S 101, 102, and 103. At least 12 semester hours of political science must be earned at Washington State University. Three hours of POL S 497 or 499 may be applied to the minor. A minimum GPA of 2.0 in the political science courses is required.

Description of Courses

PHILOSOPHY

PHIL

- 101 [HUM] Introduction to Philosophy 3**
Nature and place of philosophy in human thought; problems and achievements.
- 103 [HUM] Introduction to Ethics 3**
Ethics through analysis of contemporary moral and social issues.
- 200 [WRTG] Critical Thinking and Writing 3**
Application of critical thinking skills to essay writing.

201 [QUAN] Introduction to Formal Logic 3
Course Prerequisite: MATH 101 with a C or better, MATH 103 with a C or better, a minimum ALEKS math placement score of 40%, or higher level MATH. Core logical concepts and formal syntax, semantics and proof procedures for categorical, propositional, and basic predicate logic.

207 [HUM] Philosophy of Religion 3
Critical inquiry into the existence and nature of God; the problem of evil; the relation of faith and reason; immortality and miracles. Cooperative: Open to UI degree-seeking students.

210 [HUM] Philosophy in Film 3
The use of film as philosophical text.

220 [HUM] Philosophy of Food 3
Philosophical issues concerning the nature, production, and distribution of food, including ethical, aesthetic, metaphysical, and/or social/political dimensions of food.

280 [HUM] Islam in Theory and Practice 3
Fundamental principles of Islam, including the relation between faith and practice, and the social, economic, political, and judicial systems in Islam. (Crosslisted course offered as PHIL 280, ASIA 280).

314 [HUM] [M] Philosophies and Religions of India 3
Metaphysical, epistemological, ethical, aesthetic, social, and political views of Hinduism, Buddhism, and Islam, and their influence on Indian civilization. (Crosslisted course offered as PHIL 314, ASIA 314).

315 [HUM] [M] Philosophies and Religions of China and Japan 3
The philosophies and religions of China and Japan, and their metaphysical, epistemological, ethical, social, and political positions and views of God and gods. (Crosslisted course offered as PHIL 315, ASIA 315).

320 [M] [M] History of Ancient and Medieval Philosophy 3
Course Prerequisite: 3 hours PHIL. Pre-Socratics, Plato, Aristotle; post-Aristotelian philosophy to the Renaissance. Cooperative: Open to UI degree-seeking students.

321 History of Modern Philosophy 3
Course Prerequisite: 3 hours PHIL. Renaissance, 17th and 18th century philosophers. Cooperative: Open to UI degree-seeking students.

322 Nineteenth-century Philosophy 3
Course Prerequisite: 3 hours PHIL. The Continental, post-Kantian tradition, with emphasis on thinkers such as Hegel, Schopenhauer, Kierkegaard and Nietzsche. Cooperative: Open to UI degree-seeking students.

350 Philosophy of Science 3
Purpose and logical structure of science; human implications. Cooperative: Open to UI degree-seeking students.

360 [HUM] Business Ethics 3
The principles of ethics as applied to specific problems in business faced by individuals and corporate institutions.

365 [HUM] Biomedical Ethics 3
Ethical problems in medicine and biological research.

370 [HUM] Environmental Ethics 3
Explores the obligations we have regarding non-human parts of the environment and the justification for those obligations.

390 Topics in Philosophy 3
May be repeated for credit; cumulative maximum 6 hours.

401 Advanced Formal Logic 3
First-order predicate logic plus some metatheory, applications and/or extensions. Credit not granted for both PHIL 401 and PHIL 501. Recommended preparation: PHIL 201. Cooperative: Open to UI degree-seeking students.

406 Philosophy and Race 3
Course Prerequisite: 3 hours in PHIL or CES 201. Examination of race within western philosophy including work of philosophers of color and analysis of the category race. (Crosslisted course offered as CES 406, PHIL 406).

407 Seminar in Philosophy of Religion 3
May be repeated for credit; cumulative maximum 6 hours. Advanced topic-driven seminar. Critical analysis of traditional and contemporary religions and religious phenomena. Credit not granted for both PHIL 407 and PHIL 507. Cooperative: Open to UI degree-seeking students.

413 [CAPS] Mind of God and the Book of Nature: Science and Religion 3
Course Prerequisite: 3 hours PHIL; 3 hours [BSCI] or [PSCI] UCORE; junior standing. Methodological comparison and philosophical investigation of the relation between religion and natural science and related issues.

420 Contemporary Continental Philosophy 3
Selected movements, figures, and issues in recent continental philosophy. Recommended preparation: PHIL 320, 321 or 322. Cooperative: Open to UI degree-seeking students.

421 Kant 3
Course Prerequisite: 3 hours PHIL. Exploration of Kant's philosophy and the philosophies heavily influenced by Kant. Cooperative: Open to UI degree-seeking students.

425 Philosophy and Feminism 3
Course Prerequisite: 3 hours PHIL, WOMEN ST 101, or WOMEN ST 201. Feminist philosophy as critique of Western philosophical tradition and as alternate framework for thought. (Crosslisted course offered as PHIL 425, WOMEN ST 425).

431 Aesthetics and Philosophy of Art 3
Course Prerequisite: 3 hours PHIL; junior standing. Philosophical exploration of aesthetics experience and any or all of the arts; emphasis on value considerations and comparisons of differing media. Cooperative: Open to UI degree-seeking students.

435 East/West Philosophy of Architecture 3
Course Prerequisite: Junior standing. East/West philosophies and their impact on understanding of nature and architecture.

442 [CAPS] [M] Philosophy of Mind 3
Course Prerequisite: 3 hours PHIL; junior standing. Theories of mind, self, mental acts, psychological states and artificial intelligence. Cooperative: Open to UI degree-seeking students.

- 443 [M] Philosophy of Language 3** Course Prerequisite: 3 hours PHIL. Investigation of philosophical issues concerning meaning, reference, truth, the nature of language, and the relation between language and thought. Credit not granted for both PHIL 443 and PHIL 543. Cooperative: Open to UI degree-seeking students.
- 446 Metaphysics 3** Course Prerequisite: 3 hours PHIL. Issues and theories concerning free will and determinism, the nature of truth, the existence of God, space, time and identity. Cooperative: Open to UI degree-seeking students.
- 447 Theory of Knowledge 3** Course Prerequisite: 3 hours PHIL. Problems and theories concerning skepticism, the nature and scope of knowledge, a priori knowledge, and induction. Cooperative: Open to UI degree-seeking students.
- 450 Data Analytics Ethics 3** Course Prerequisite: Junior standing. Ethical issues concerning the collection, use, and dissemination of data.
- 460 [M] Ethical Theory 3** Course Prerequisite: 3 hours PHIL. Problems of ethical theory as treated by historical and contemporary philosophers. Cooperative: Open to UI degree-seeking students.
- 462 [M] Women and Ethics 3** Course Prerequisite: PHIL 101, WOMEN ST 101, or WOMEN ST 201. Study of gender and feminism and their effect on contemporary ethical theories and issues. (Crosslisted course offered as WOMEN ST 462, PHIL 462). Cooperative: Open to UI degree-seeking students.
- 470 Philosophy of Law 3** Course Prerequisite: 3 hours PHIL or POL S Selected topics pertaining to moral and philosophical evaluation of law. Credit not granted for both PHIL 470 and PHIL 570. Cooperative: Open to UI degree-seeking students.
- 472 [M] Social and Political Philosophy 3** Course Prerequisite: 3 hours PHIL or POL S Problems of normative social and political theories; historical and contemporary philosophers. Cooperative: Open to UI degree-seeking students.
- 499 Special Problems V 1-4** May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 501 Advanced Formal Logic 3** First-order predicate logic plus some metatheory, applications and/or extensions. Credit not granted for both PHIL 401 and PHIL 501. Recommended preparation: PHIL 201. Cooperative: Open to UI degree-seeking students.
- 504 Special Topics in Philosophy 3** May be repeated for credit; cumulative maximum 6 hours. Intensive study of a special topic not otherwise covered in depth in the curriculum. Cooperative: Open to UI degree-seeking students.
- 507 Seminar in Philosophy of Religion 3** May be repeated for credit; cumulative maximum 6 hours. Advanced topic-driven seminar. Critical analysis of traditional and contemporary religions and religious phenomena. Credit not granted for both PHIL 407 and PHIL 507. Cooperative: Open to UI degree-seeking students.
- 510 Seminar in the History of Philosophy 3** May be repeated for credit; cumulative maximum 6 hours. Systematic exploration of the central works of an individual philosopher or philosophical movement. Cooperative: Open to UI degree-seeking students.
- 520 Seminar in Ethical Theory 3** The major issues, views, and figures of ethical theory from ancient Greece to the present. Cooperative: Open to UI degree-seeking students.
- 522 Seminar in Metaphysics 3** The nature of reality, through study of key concepts such as God, personhood, free will, causation, space, time, and identity. Cooperative: Open to UI degree-seeking students.
- 524 Seminar in Epistemology 3** Classical problems, questions, and theories involving the concept of knowledge. Cooperative: Open to UI degree-seeking students.
- 530 Bioethics 2** Professional ethics for scientists; ethical implications of new technologies; obligations to human and non-human research subjects. Cooperative: Open to UI degree-seeking students.
- 532 Seminar in Business Ethics 3** The major issues in business ethics, both domestic and international, from general principles to specific cases. Cooperative: Open to UI degree-seeking students.
- 535 Advanced Biomedical Ethics 3** Current ethical issues in medical practice, medical research and public policy relating to health issues. Cooperative: Open to UI degree-seeking students.
- 540 Ethics and Social Science Research 3** Professional ethics for social science research, ethical conduct of research, obligations to human subjects and ethical implications of methods and technologies.
- 543 [M] Philosophy of Language 3** Investigation of philosophical issues concerning meaning, reference, truth, the nature of language, and the relation between language and thought. Credit not granted for both PHIL 443 and PHIL 543. Cooperative: Open to UI degree-seeking students.
- 570 Philosophy of Law 3** Selected topics pertaining to moral and philosophical evaluation of law. Credit not granted for both PHIL 470 and PHIL 570. Cooperative: Open to UI degree-seeking students.
- 600 Special Projects or Independent Study V 1-18** May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination V 1-18** May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

POLITICAL SCIENCE

POL S

- 101 [SSCI] American National Government 3** Introduction to American politics exploring the constitution, political institutions and actors, the policy making process, and various public policies.
- 102 [SSCI] Introduction to Comparative Politics 3** Nature of the state; fundamental problems of government and politics; ideological and institutional comparison of democracies and dictatorships.
- 103 [SSCI] International Politics 3** Operation and interaction of national, international, and supranational communities; major world problems since 1945.
- 201 Political Research Methods 3** Training in social science research methodologies as applied to political phenomena.
- 206 State and Local Government 3** Institutions, processes, and problems, with special reference to the state of Washington.
- 276 Special Topics: Study Abroad V 1-15** May be repeated for credit. S, F grading.
- 277 Special Topics: Study Abroad V 1-15** May be repeated for credit. S, F grading.
- 300 The American Constitution 3** Constitutional principles as established by the Supreme Court and related political developments.
- 301 Political Simulations 3** May be repeated for credit; cumulative maximum 9 hours. Preparation for and participation in political simulations.
- 305 Gender and Politics 3** Role of gender in political behavior; voting and political participation; women as subjects and objects of political systems.
- 314 National States and Global Challenges 3** Comprehensive introduction to the processes of the economic and political integration of the European Union.
- 316 American Public Policy 3** Institutions, processes, and substantive issues of American public policy and policy formation.
- 317 Media and Politics 3** Relationship between the media and American political institutions and the public.
- 333 Development of Marxist Thought 3** Marxist theory from the original writing of Marx and Engels to contemporary developments.
- 340 Introduction to Public Administration 3** Basic theories of administrative organization, relationships, and behavior.

- 375 Chicana/o and Latina/o Politics 3** Character, role, and goals of Chicano/Latino politics; contemporary Chicano/Latino issues. (Crosslisted course offered as CES 359, POL S 375).
- 381 Crime and Justice in the Movies 3 (2-2)** Course Prerequisite: CRM J 101. Mass media as both reflector and shaper of public attitudes and opinions about crime, criminals, law, order, and justice; using films. (Crosslisted course offered as CRM J 381, POL S 381).
- 400 Political Science Issues 3** May be repeated for credit; cumulative maximum 6 hours. Current issues in political science.
- 402 Civil Liberties 3** Origin and development of civil liberties; responsibility of the branches of government and the people for their maintenance.
- 404 [M] The Judicial Process 3** Relationship of judicial behavior to structure, politics and the behavior of other participants in the judicial process.
- 405 [M] Comparative Criminal Justice Systems 3** Course Prerequisite: CRM J 101. Comparative study of criminal justice systems in the US and selected foreign countries. (Crosslisted course offered as CRM J 405, POL S 405). Cooperative: Open to UI degree-seeking students.
- 410 History of American Indian Sovereignty and Federal Indian Law 3** The history of sovereignty and Federal Indian Law against the backdrop of treaties and trust responsibility. (Crosslisted course offered as HISTORY 410, ANTH 410, POL S 410).
- 416 Policy Analysis 3** Analysis of public policy formation, evaluation and implementation.
- 417 Voting and Elections 3** Analysis of voting behavior and elections; turnout, influences on voter choice, congressional and presidential elections, campaign finance, and polling.
- 418 Human Issues in International Development 3** Interdisciplinary analysis of complex interaction between tradition and modernity in Third World societies. (Crosslisted course offered as ANTH 418, POL S 418, SOC 418).
- 420 Political Parties and Interest Groups 3** Roles, characteristics, and theories of political parties; organization, behavior, and impact of interest groups.
- 424 [M] US National Security Policy 3** Substantive and theoretical research on issues relevant to formulation and requirements of post-Cold War, US national security and defense policy.
- 427 United States Foreign Relations 3** Ends and means in foreign policy; organization, management, control, and current policy issues. (Crosslisted course offered as POL S 427, HISTORY 486).
- 428 [CAPS] Issues in Political Psychology 3** Course Prerequisite: POL S 101 or PSYCH 105; junior standing. Application of concepts and methods of political science and psychology to the study of how psychological factors influence political phenomena.
- 429 Special Topics in American Foreign and Defense Policy 3** May be repeated for credit; cumulative maximum 6 hours. Current issues in foreign policy.
- 430 [CAPS] The Politics of Natural Resource and Environmental Policy 3** Course Prerequisite: Junior standing. Issues and problems of natural resource and environmental policy.
- 432 [M] Comparative Public Policy 3** Processes of public policy formation and outcomes in post-industrial democracies, and how to analyze it in a comparative perspective.
- 435 Politics of Developing Nations 3** Issues and problems of political development and modernization common among developing nations.
- 436 Disability, Aging, and Public Policy 3** Application of disability and aging theory to public policy challenges in the 21st century.
- 437 [M] Classical Political Thought 3** The development of political philosophy from the pre-Socratics to Machiavelli.
- 438 [M] Recent Political Thought 3** The development of political thought since Machiavelli.
- 442 [M] Leadership Skills for the Public Sector 3** Leadership, motivation, team-building, group dynamics, interpersonal and group conflict and job design for the public sector.
- 443 Administrative Jurisprudence 3** Study of the origins, nature, and practice of justice and law in public administration.
- 445 Public Personnel Administration 3** Development of American civil service systems and concepts; problems and techniques involved in selection and management of public employees. Cooperative: Open to UI degree-seeking students.
- 446 [M] Public Budgeting 3** The government budget as an instrument of politics, planning and control; organizing for democratic accountability.
- 447 [M] Comparative Public Administration 3** Public administration systems in Europe, Japan, Socialist and developing countries; origins and development.
- 448 Urban Politics and Policy 3** Urban political processes and policies; intergovernmental relationships; impact of urban reform.
- 450 [M] The Legislative Process 3** Role of legislatures in a democratic system; problems of representation; election and tenure of lawmakers; legislative organization and procedures.
- 455 The Presidency 3** Organization and processes of executive institutions at the national level; uses and limits of executive power.
- 472 [M] European Politics 3** Government and politics of postindustrial societies, including West Europe and Japan.
- 474 African Politics 3** Course Prerequisite: Junior standing. Historical, economic, and social factors that shape contemporary African political systems and problems of nation-building.
- 475 Mao to Deng: The People's Republic of China, 1949 - Present 3** The major political, social, economic and cultural developments during the People's Republic of China. (Crosslisted course offered as HISTORY 475, ASIA 475, POL S 475).
- 476 [M] Revolutionary China, 1800 to Present 3** Continuity and change in the political, social, cultural and economic experience of China since 1800. (Crosslisted course offered as HISTORY 476, ASIA 476, POL S 476).
- 497 Political Science Internship V 1-12** May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: By department permission. On/off campus internship in federal, state, or local government institutions; nonprofit or public organizations; written assignments and readings required. S, F grading.
- 498 Public Policy Internship V 3-12** May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: By permission only. Internship in government institution, nonprofit or public organization, or (by permission) for-profit organization; written assignments and readings required. S, F grading.
- 499 Special Problems V 1-4** May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 501 The Scope of Political Science 3** Historical development and present status of the discipline; contemporary issues and future trends.
- 502 Seminar in Normative Theory 3** Elements of normative theory developments; examination of bases of controversies and approaches in the modern literature using historical sources.
- 503 Research Methods in Political Science 3** Social science research design topics, measurement, sampling, data sources, experimental and quasi-experimental designs, field and historical designs, content analytic designs. Cooperative: Open to UI degree-seeking students.
- 504 Quantitative Methods in Political Science 3** Applied statistical skills, enabling understanding of substantive political and social questions.
- 510 Seminar on American Institutions and Processes 3** Seminar required of all graduate students using this field as a major or a minor; it is a prerequisite of all other graduate seminars in the field.
- 511 Seminar in American Political Thought 3** May be repeated for credit; cumulative maximum 6 hours. The genesis and development of political thought in the United States.

- 512 Seminar in American Institutions** 3 May be repeated for credit; cumulative maximum 6 hours. Origin, development, and contemporary issues in political organization and structure in the United States.
- 513 Seminar in American Political Behavior** 3 May be repeated for credit; cumulative maximum 6 hours. Theoretical approaches to, and empirical analysis of, mass political behavior in the US.
- 514 Seminar in Public Policy** 3 Examination of central questions in public policy including the nature of public policy, policy analysis, and government intervention in society.
- 516 Seminar on Law, Courts, and Judicial Politics** 3 Seminar on law, courts, and judicial politics. Cooperative: Open to UI degree-seeking students.
- 530 American Foreign Policy: Theories and Applications** 3 Theories of international politics applied to American foreign policy. Cooperative: Open to UI degree-seeking students.
- 531 Seminar in International Security** 3 International security and arms control politics, negotiations, agreements. Cooperative: Open to UI degree-seeking students.
- 532 Seminar in International Political Economy** 3 Institutions, politics, and decision-making processes in managing international economic relations.
- 533 Topics in Political Psychology** 3 May be repeated for credit; cumulative maximum 6 hours. Psychological influences on political decision making, bargaining, conflict and conflict resolution options.
- 534 Seminar in Comparative Politics** 3 Cooperative: Open to UI degree-seeking students.
- 536 Special Topics in Comparative Politics** 3 May be repeated for credit; cumulative maximum 6 hours. Advanced issues seminar in international and comparative politics.
- 537 Concepts and Methods in Comparative Politics** 3 May be repeated for credit; cumulative maximum 6 hours. Selected concepts (state, political participation), and methods (cross-national analysis, case study approaches) in comparative politics.
- 538 International Development and Human Resources** 3 History of and recent changes in international development emphasizing anthropological perspectives. (Crosslisted course offered as ANTH 519, POL S 538, SOC 519).
- 539 The Political Science Profession** 1 Methods, problems, and purposes of teaching, research, and vocation in political science. S, F grading.
- 540 Proseminar in Public Administration** 3 Proseminar over viewing basic theories of administrative organization, relationships, and behavior.
- 541 Seminar in Evaluation Research** 3 Interrelationship of ideology, data, policy development, and policy implementation in public policy analysis. (Crosslisted course offered as CRM J 540, POL S 541). Cooperative: Open to UI degree-seeking students.
- 542 Proseminar in Administration, Justice, and Applied Policy Studies** 3 May be repeated for credit; cumulative maximum 6 hours. Analytical perspectives and theoretical issues. Cooperative: Open to UI degree-seeking students.
- 543 Topics in Public Administration and Policy** 3 May be repeated for credit; cumulative maximum 6 hours. Examination of the literature on the politics of the American public policy process.
- 544 The Politics of Policy Process** 3 American political process; policy making under the constraints of a democratic system; relationship to the (non) achievement of the public interest.
- 590 Policy Studio Course I** 2 Course Prerequisite: By instructor permission. Public policy training for graduate students in the science and engineering fields through the NSF-IGERT program.
- 591 Policy Studio Course II** 2 Course Prerequisite: By instructor permission. Public policy training for graduate students in the science and engineering fields through the NSF-IGERT program.
- 592 Policy Studio Course III** 2 Course Prerequisite: By instructor permission. Public policy training for graduate students in the science and engineering fields through the NSF-IGERT program.
- 597 Graduate Internship** V 2-12 May be repeated for credit; cumulative maximum 12 hours. On/off campus internship in federal, state, or local government institutions; nonprofit or public organizations; written assignments and readings required. S, F grading.
- 600 Special Projects or Independent Study** V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination** V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

702 Master's Special Problems, Directed Study, and/or Examination V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Political Science PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

The Pre-Dental Curriculum

healthprofessions.wsu.edu
Smith Center for Undergraduate Education (CUE) 502
509-335-4549
health.professions@wsu.edu

Director and Clinical Assistant Professor, Donald Allison, PhD, PA-C

All pre-dental students are assisted with their preparation for application to dental schools through the Health Professions Student Center (HPSC). health.professions@wsu.edu.

Becoming a dentist requires a program of graduate study in dental school as well as undergraduate preparative coursework. No particular major is required and students are more likely to excel in majors they enjoy. Adequate latitude exists in the dental schools' requirements so that the Health Professions Specialist is able to suggest a schedule of studies to meet the needs of the individual student. Typically the coursework in each of the following areas, will meet the requirements of almost all institutions and also give a good preparation for the Dental Aptitude Test (DAT).

Most dental schools require the following coursework:

- English composition (ENGLISH 101 and an additional writing course)
- General chemistry (CHEM 105 and 106, or CHEM 115 and 116)
- Organic chemistry (CHEM 345 and 348)
- Physics (PHYSICS 101 and 102 or PHYSICS 201 and 202)
- Introductory biology (BIOLOGY 106 and 107)
- Molecular biology (MBIOS 305)
- Biochemistry (MBIOS 303)

In addition, some institutions require Microbiology and Molecular Laboratory (MBIOS 304), and/or Introductory Psychology (PSYCH 105). The Health Professions Specialists in the Health Professions Student Center assist all students regardless of major, who have an interest in a health care profession in meeting their goal. They will also assist students in selection of appropriate classes to meet the

requirements of the dental schools to which they intend to apply.

Admission to a school of dentistry is based on satisfactory completion of the entrance requirements of that school, attainment of satisfactory scholastic record, satisfactory to exceptional scores on the Dental Admission Test (DAT), the possession of personal qualifications necessary for the study of dentistry, and exemplary letters of reference.

The Learning Goals for the Pre-dental curriculum are based on the WSU Learning Goals of the Baccalaureate and can be identified as (1) acquire and assimilate the disciplinary knowledge that is essential to successful careers as dental students and dentists (2) reason critically (3) develop lifelong learning skills (4) write and speak effectively and (5) develop a sense of self in society.

Additional information can be obtained from Health Professions Specialist, Melissa Artstein-McNassar, Ph.D., Health Professions Student Center, Washington State University, 502 Smith Center for Undergraduate Education, Pullman, WA 99164-4551.

The Pre-Health Curriculum

healthprofessions.wsu.edu

Smith Center for Undergraduate Education (CUE) 502

509-335-4549

health.professions@wsu.edu

Director and Clinical Assistant Professor, Donald Allison, PhD, PA-C

All pre-health students are assisted with their preparation for application to health professions schools through the Health Professions Student Center (HPSC). health.professions@wsu.edu.

Entering a health care professional program requires specific undergraduate preparative coursework. Typically, there are additional requirements that must be met for admission. The Health Professions Specialists in the Health Professions Student Center assist all students, regardless of major, who have an interest in a health care profession in meeting their goal.

Health Professions Specialists guide students with interest in pre-medical, pre-dental, pre-nutrition and exercise physiology, pre-speech and hearing sciences, pre-nursing, pre-pharmacy, pre-veterinary, pre-physical therapy, pre-physician assistant, pre-occupational therapy, pre-optometry, and many others.

The Learning Goals for the Pre-health curriculum are based on the WSU Learning Goals of the Baccalaureate and can be identified as (1) acquire and assimilate the disciplinary knowledge that is essential to successful careers as a health professions student and practitioner (2) reason critically (3) develop lifelong learning skills (4) write and speak effectively and (5) develop a sense of self in society.

Additional information on preparation for admission to health profession programs can be obtained from any of the Health Professions Specialists in the Health Professions Student Center, Washington State University, 502 Smith Center for Undergraduate Education, Pullman, WA 99164-4551.

The Pre-Law Curriculum

prelaw.wsu.edu

Students interested in legal education may prepare for admission to law school from any major in any college at the University. The American Bar Association recommends completing baccalaureate degrees before entering law school, attaining as rich an undergraduate education as possible, and developing skills in reading, writing, critical thinking, oral communication, research, and task management. Admission to law school is based in most cases on a student's Law School Admissions Test (LSAT) score, grade point average, personal statement, letters of recommendation, quality of the institution where undergraduate work is completed, and difficulty and range of course work. The ABA recommends completing a major, but double majors or minors have no effect on admission. Pre-law students are advised to pursue majors in a discipline that interests them: students are more likely to excel in majors they enjoy, and the process of exploring one subject in greater depth will provide valuable preparation for study of the law. No particular major is recommended and there are no minimum requirements with regard to course work, but the American Bar Association has identified knowledge of certain subjects as important groundwork for law school: history, especially American history; political thought and theory and the American political system; ethical theory and theories of justice; economics; basic math and finance; human behavior and social interaction; diverse cultures both within and outside the United States; international and global issues. For best results students should make an appointment with a pre-law advisor through the Pre-Law Resource Center (502 CUE; email: prelaw@wsu.edu). Three undergraduate programs at the University offer pre-law curricula: History (301 Wilson Hall), Philosophy (801 Johnson Tower), and Political Science (801 Johnson Tower). Additional information can be obtained from Professor Michael Salamone, (Washington State University, 812 Johnson Tower, Pullman, WA 99164-4880).

The Pre-Medical Curriculum

healthprofessions.wsu.edu

Smith Center for Undergraduate Education (CUE) 502

509-335-4549

health.professions@wsu.edu

Director and Clinical Assistant Professor, Donald Allison, PhD, PA-C

All pre-medical students are assisted with their preparation for medical school through the Health Professions Student Center (HPSC). health.professions@wsu.edu.

Becoming a physician requires a program of graduate study in medical school as well as undergraduate preparative coursework. No particular major is required and students are more likely to excel in majors they enjoy. Adequate latitude exists in the medical schools' requirements so that the Health Professions Specialist is able to suggest a schedule of

studies to meet the needs of the individual student. Typically, the coursework in each of the following areas, will meet the requirements of almost all institutions and also give a good preparation for the Medical College Admission Test (MCAT).

- General chemistry (CHEM 105 and 106, or CHEM 115 and 116)
- Organic chemistry (CHEM 345 and 348)
- Physics (PHYSICS 101 and 102 or PHYSICS 201 and 202)
- Introductory biology (BIOLOGY 106 and 107)
- Biochemistry (MBIOS 303)
- Statistical Methods (STAT 212)
- Introductory psychology (PSYCH 105)
- Introductory Sociology (SOC 101)

All medical schools assume that applicants will have developed math skills adequate to the demands of the required courses listed above; however, a few schools specify either a semester or a year of calculus (MATH 140 or 171), or a full year of calculus (MATH 171 and 172).

Acceptance of a student by a medical school is contingent on the satisfactory completion of at least the minimum entrance requirements of that school, attainment of a superior scholastic record, good to excellent scores on the MCAT, and possession of personal qualifications appropriate to success in the medical profession. Most schools require applicants to appear for a personal interview. In addition, letters of recommendation from several college teachers, physicians and other professionals must strongly support the applicant.

The Learning Goals for the Pre-medical curriculum are based on the WSU Learning Goals of the Baccalaureate and can be identified as (1) acquire and assimilate the disciplinary knowledge that is essential to successful careers as medical students and physicians (2) reason critically (3) develop lifelong learning skills (4) write and speak effectively and (5) develop a sense of self in society.

Additional information can be obtained from Health Professions Specialist, Melissa Artstein-McNassar, Ph.D., Health Professions Student Center, Washington State University, 502 Smith Center for Undergraduate Education, Pullman, WA 99164-4551.

The Pre-Nursing Curriculum

healthprofessions.wsu.edu

Smith Center for Undergraduate Education (CUE) 502

509-335-4549

health.professions@wsu.edu

Director and Clinical Assistant Professor, Donald Allison, PhD, PA-C

All pre-nursing students are assisted with their preparation for application to nursing school through the Health Professions Student Center (HPSC). health.professions@wsu.edu.

Students interested in nursing must meet the requirements for admission. The requirements for admission to the WSU College of Nursing programs are listed in the WSU Spokane catalog under Nursing. The direct BSN program is based on the Spokane, Yakima and Tri-Cities locations of WSU. In Pullman, pre-nursing students typically spend their first

two years fulfilling their core curriculum and pre-nursing requirement courses, and if accepted, they then spend their junior and senior years fulfilling their nursing program courses at the WSU College of Nursing or other nursing program of student choice. Additional admissions requirements vary based on the nursing program of student interest.

The Learning Goals for the pre-nursing curriculum are based on the WSU Learning Goals of the Baccalaureate and can be identified as (1) acquire and assimilate the disciplinary knowledge that is essential to successful careers as nursing students and nurses (2) reason critically (3) develop lifelong learning skills (4) write and speak effectively and (5) develop a sense of self in society.

Additional information on preparation for admission to nursing can be obtained from the pre-nursing Health Professions advisors, LeeAnn Tibbals or Mary Ohnemus, Health Professions Student Center, Washington State University, 502 Smith Center for Undergraduate Education, Pullman, WA 99164-4551.

The Pre-Nutrition and Exercise Physiology Curriculum

healthprofessions.wsu.edu
Smith Center for Undergraduate Education (CUE) 502
509-335-4549
health.professions@wsu.edu

Director and Clinical Assistant Professor, Donald Allison, PhD, PA-C

All pre-Nutrition and Exercise Physiology students are assisted with their preparation for application to the program in Nutrition and Exercise Physiology through the Health Professions Student Center (HPSC). health.professions@wsu.edu.

Students interested in the program in Nutrition and Exercise Physiology (NEP) must meet the requirements for admission. The requirements for admission are listed in the WSU Spokane catalog under Nutrition and Exercise Physiology. Pre-NEP students typically spend their first two years in Pullman fulfilling their core curriculum and pre-NEP requirement courses, and then if accepted, they spend their junior and senior years fulfilling their NEP program courses on the WSU Spokane campus.

The Learning Goals for the pre-NEP curriculum are based on the WSU Learning Goals of the Baccalaureate and can be identified as (1) acquire and assimilate the disciplinary knowledge that is essential to successful careers (2) reason critically (3) develop lifelong learning skills (4) write and speak effectively and (5) develop a sense of self in society.

Additional information on preparation for admission to NEP can be obtained from Health Professions advisor, Mary Ohnemus, Health Professions Student Center, Washington State University, 502 Smith Center for Undergraduate Education, Pullman, WA 99164-4551.

The Pre-Pharmacy Curriculum

healthprofessions.wsu.edu
Smith Center for Undergraduate Education (CUE) 502
509-335-4549
health.professions@wsu.edu

Director and Clinical Assistant Professor, Donald Allison, PhD, PA-C

All pre-pharmacy students are assisted with their preparation for application to pharmacy schools through the Health Professions Student Center (HPSC). health.professions@wsu.edu.

Students interested in entering a professional Doctor of Pharmacy (PharmD) program at schools and colleges across the country must meet the requirements for admission. The requirements for admission to the WSU PharmD program are listed in the WSU Spokane catalog under Pharmacy. A bachelor's degree is not required for admission to most colleges of pharmacy and pre-pharmacy students at the WSU Pullman campus typically take 3 years fulfilling their pre-pharmacy requirements. Then, if admitted to the highly competitive WSU PharmD program, the student will spend 4 years in professional school, regardless of prior degrees.

Additional information on preparation for admission to pharmacy schools can be obtained from the pre-pharmacy Health Professions Specialist, Marian McDonnell Horton, M.A., Health Professions Student Center, Washington State University, 502 Smith Center for Undergraduate Education, Pullman, WA 99164-4551.

The Pre-Physical Therapy, Pre-Physician Assistant, Pre-Occupational Therapy Curriculum

healthprofessions.wsu.edu
Smith Center for Undergraduate Education (CUE) 502
509-335-4549
health.professions@wsu.edu

Director and Clinical Assistant Professor, Donald Allison, PhD, PA-C

All pre-physical therapy, pre-occupational therapy, or pre-physician assistant students are assisted with their preparation for allied health fields such as physical therapy, occupational therapy, or physician assistant programs through the Health Professions Student Center (HPSC). health.professions@wsu.edu.

Students interested in allied health fields such as physical therapy, occupational therapy, or physician assistant programs may prepare for admission from many majors in the University as long as they meet the minimum requirements for admission. Admission to physical therapy, occupational therapy, and physician assistant programs is highly competitive. Your Health Professions Specialist is able to suggest a plan of studies and extracurricular activities to meet the needs of the individual student.

The Learning Goals for the pre-physical therapy, pre-occupational therapy, and pre-physician assistant curriculum are based on the WSU Learning Goals of the Baccalaureate and can be identified as (1) acquire and assimilate the disciplinary knowledge that is essential to successful careers (2) reason critically (3) develop lifelong learning skills (4) write and speak effectively and (5) develop a sense of self in society.

Additional information on preparation for admission to physical therapy and occupational therapy programs can be obtained from the pre-physical therapy and pre-occupational therapy Health Professions Specialist. Additional information on preparation for admission to physician assistant programs can be obtained from the physician assistant Health Professions Specialist Melissa Artstein-McNassar, Ph.D., Health Professions Student Center, Washington State University, 502 Smith Center for Undergraduate Education, Pullman, WA 99164-4551.

The Pre-Speech and Hearing Sciences Curriculum

healthprofessions.wsu.edu
Smith Center for Undergraduate Education (CUE) 502
509-335-4549
health.professions@wsu.edu

Director and Clinical Assistant Professor, Donald Allison, PhD, PA-C

All pre-Speech and Hearing Sciences students are assisted with their preparation for certification to the program in Speech and Hearing Sciences through the Health Professions Student Center (HPSC). health.professions@wsu.edu.

Students interested in the program in Speech and Hearing Sciences (SHS) must meet the requirements for certification. The requirements for certification are listed in the WSU Spokane catalog under Speech and Hearing Sciences. Pre-SHS students typically spend their first two years in Pullman fulfilling their core curriculum and pre-SHS requirement courses, and then they spend their junior and senior years fulfilling their SHS program courses on the WSU Spokane campus.

Additional information on certification to Speech and Hearing Sciences can be obtained from Health Professions advisor, Mary Ohnemus, Health Professions Student Center, Washington State University, 502 Smith Center for Undergraduate Education, Pullman, WA 99164-4551.

The Pre-Veterinary Curriculum

healthprofessions.wsu.edu
Smith Center for Undergraduate Education (CUE) 502
509-335-4549
prehealth.advising@wsu.edu

Director and Clinical Assistant Professor, Donald Allison, PhD, PA-C

All pre-veterinary students are assisted with their preparation for veterinary school through the Health Professions Student Center (HPSC). health.professions@wsu.edu.

Students interested in veterinary medicine may prepare for admission from any major in the University as long as they meet the minimum requirements for admission. The requirements for admission are listed on the Health Professions Student Center webpage and requirements specific to the WSU College of Veterinary Medicine can be found in this catalog under Veterinary Medicine. Admission to the veterinary program is highly competitive. A minimum of three years of college or completion of a baccalaureate degree is essential. The Health Professions Specialists in the Health Professions Student Center will assist all students, regardless of major, who have an interest in a veterinary medicine profession in meeting their goal.

The Learning Goals for the pre-veterinary curriculum are based on the WSU Learning Goals of the Baccalaureate and can be identified as (1) acquire and assimilate the disciplinary knowledge that is essential to successful careers as veterinary students and veterinarians (2) reason critically (3) develop lifelong learning skills (4) write and speak effectively and (5) develop a sense of self in society.

Additional information on preparation for admission to veterinary medicine can be obtained from the pre-veterinary Health Professions Specialist, Becky Jewell, M.A., Health Professions Student Center, Washington State University, 502 Smith Center for Undergraduate Education, Pullman, WA 99164-4551.

Department of Psychology

psychology.wsu.edu
Johnson Tower 233
509-335-2631

Professor and Department Chair, D. Marcus; Professors, A. Blume, G. L. Burns, R. M. Craft, D. Dyck, M. Gartstein, J. M. Hinson, F. K. McSweeney, M. M. Morgan, C. D. Parks, T. M. Probst, K. Schmaling, M. Schmitter-Edgecombe, W. Scott, P. M. Whitney, R. Quock; Associate Professors, C. Barry, T. Barry, S. Bauman, L. Fournier, P. Kwon, S. Lakatos, P. S. Strand, S. Tragesser, B. Walker; Assistant Professors, J. Ehrlinger, R. Magnan, B. Sharpless; Clinical Professor, S. Swindell; Clinical Associate Professors, S. Penningroth, D. Posey, L. Smith-Nelson, B. Wright; Clinical Assistant Professors, C. Cuttler, L. Daffin, M. C. Kirchoff, J. Peters, A. L. Matthews; Professors Emeriti, T. A. Brigham, J. W. Wright.

The bachelor's degree program provides for either a major or a minor in psychology. The program for majors is designed for those who wish to study psychology as part of a liberal education; for those who plan to use their training in related vocations such as the professions, governmental organizations, business and industry, and psychological services; and for those who are preparing for graduate work in psychology. Course offerings are open to students in other departments who need a background in those aspects of psychology that are related to their respective fields.

The department offers courses of study leading

to the Bachelor of Science in Psychology and the Doctor of Philosophy.

Excellent facilities are available for instruction and research in psychology. There are specially designed facilities for research in learning, memory, perception, animal behavior, neurosciences and social interaction. Departmental facilities also include the Psychology Clinic, which is a training clinic for doctoral students in clinical psychology. In addition, cooperative arrangements with other units of the university and with outside agencies and institutions make it possible for students to gain first-hand experience in research and professional work. The university maintains a comprehensive library of books and journals in psychology and related fields.

Student Learning Outcomes

Students graduating with a bachelor of science degree in psychology will be able to: 1) use the major concepts, principles, theories and perspectives of the discipline to explain psychological phenomena and address real world issues; 2) demonstrate tolerance for ambiguity while using reasoning, skepticism, and empirical evidence to recognize, develop, and evaluate claims made about psychological topics; 3) effectively design, conduct, and interpret ethical studies to address psychological questions; 4) communicate effectively by using professional writing and oral conventions; 5) practice information literacy by locating and evaluating relevant references from a variety of sources; 6) explain how individual differences interact with social, economic, and cultural factors to affect perceptions, cognitions, and behaviors; and 7) develop skills and knowledge that enable them to better understand themselves, behave ethically and responsibly, and pursue their unique personal and professional goals. For an expanded description of these program goals, see http://www.wsu.edu/psychology/undergraduate/major_minor/

Graduate Programs

The graduate program leads to advanced degrees for qualified students who plan careers as psychologists. The course of study for the Doctor of Philosophy degree may be directed toward either a specialization in clinical or experimental psychology. The graduate training program in clinical psychology at Washington State University is accredited by the American Psychological Association.

Student Learning Outcomes (Clinical Psychology)

The Clinical Psychology Program is based on the scientist-practitioner model of training. The Program is designed to integrate theory, research, and clinical practice in the training of students. The goals of the program are to produce graduates who (1) have a broad knowledge of scientific psychology; (2) can provide evidence-based clinical services that are consistent with ethical and professional standards, including knowledge of and sensitivity to issues of diversity; and (3) are capable of contributing to current knowledge in clinical psychology.

Student Learning Outcomes (Experimental Psychology)

The doctoral program in Experimental Psychology is designed to produce skilled, innovative, and productive experimental psychologists.

Degree recipients are expected to be (1) highly knowledgeable about their specialty area (Cognition, Biological, Social, Industrial/Organizational, Health, or Applied Quantitative Methods), (2) well-versed in general experimental psychology, (3) able to identify significant research problems, (4) conversant with a wide variety of strategies for generating and testing hypotheses that emerge from these problems, and (5) able to effectively communicate scientific results.

Preparation for Graduate Study

Students who contemplate work leading to advanced degrees are urged to confer as early as possible with a psychology faculty mentor. Graduate programs require a solid background in mathematics, natural sciences, physics, philosophy, and social sciences as well as appropriate preparation in psychology itself.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

PSYCHOLOGY - BACHELOR OF SCIENCE (120 HOURS)

The Bachelor of Science in Psychology requires a minimum of 35 credit hours in PSYCH, at least 15 hours of which must be in 300-400-level courses. Students must take at least 10 credit hours of psychology in residence at WSU and must maintain at least a C average in PSYCH courses. Students must have two years of one foreign language in high school or take one year in college of a modern foreign language before graduation. Beyond certain minimum requirements there is flexibility in the degree program, in accordance with the needs of the individual student. A student may certify as a BS major after completion of 30 semester hours, PSYCH 311 with a C- or better, and cumulative GPA of 2.5 or better.

For the BS degree in Psychology, the four learning goals are: (1) Students will understand basic research design and analysis; (2) Students will be able to describe societal influences on individual behavior, and they will display an understanding of the cultural relativism inherent in defining what is normal and abnormal behavior; (3) Students will be able to critically evaluate scientific studies; (4) Students will demonstrate proficiency in the written communication of psychological concepts.

First Year

First Term	Hours
BIOLOGY 101 [BSCI] and 105, or BIOLOGY 102 [BSCI], 106 [BSCI], or 107 [BSCI]	4
Diversity [DIVR]	3
ENGLISH 101 [WRTG]	3
PSYCH 105 [SSCI]	3
Second Term	Hours
Communication [COMM] or Written Communication [WRTG]	3
HISTORY 105 [ROOT]	3
Humanities [HUM]	3
Quantitative Reasoning [QUAN]	3 or 4
Foreign Language or Electives	3 or 4

Second Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
Physical Sciences [PSCI] with lab	4
PSYCH 210	3
Foreign Language and/or Electives	5
<i>Second Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
PSYCH 311	4
Electives	7
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
Focus Area PSYCH Electives ¹	9
PSYCH 312 [M]	4
Electives	3

<i>Second Term</i>	<i>Hours</i>
Focus Area PSYCH Electives ¹	6
300-400-level Electives	10

Fourth Year

<i>First Term</i>	<i>Hours</i>
Focus Area PSYCH Electives ¹	6
Integrative Capstone [CAPS]	3
PSYCH [M] Course	3
300-400-level Electives	4

<i>Second Term</i>	<i>Hours</i>
Electives	15
Complete Psychology Exit Interview and Survey	

¹ Focus Area Electives: 21 credits required. Students must complete at least 2 courses from each of the following areas: 1) Neuroscience/Cognition: PSYCH 265, 372, 384, 473, 490, 491, 492; 2) Social/Motivational PSYCH 230, 306, 307, 308, 309, 321, 328, 350, 403, 466, 470; and 3) Clinical/Counseling: PSYCH 110, 320, 324, 333, 342, 361, 363, 440, 442, 444, 464, 468. Additional approved courses include PSYCH 301, 401, 412, 445, 480, 495, 496, 497, and 498. Note that many courses require prerequisites and not all courses are offered both Fall and Spring semester. Contact advisor for additional information.

Minors**Addiction Studies (Vancouver only)**

A minor in addiction studies requires 17 – 22 hours depending on the track. The three tracks are: Track 1 (professional certification): comprising coursework primarily in the department of psychology and aimed at preparing students for certification as chemical dependency professionals (CDP) in Washington State. Track 2 (non-certification): comprising coursework primarily in the departments of sociology and criminal justice, aimed at students preparing for careers in public policy, law enforcement, social work, and related fields, who wish to obtain additional training in the political, social, and cultural components of addictive behaviors (but who do not wish to be

certified as chemical dependency professionals in Washington State). Track 3 (interdisciplinary): integrating psychological, behavioral, sociological, and criminal justices issues into models of addiction intervention and prevention. Credit hours for the minor must include 9 hours of upper-division work taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.

Psychology

The minor in psychology may be certified after the completion of 60 semester hours. It requires 18 credit hours in PSYCH, of which at least 9 must be taken at WSU and at least 9 must be in graded 300-400-level courses. PSYCH 105 or 198 is required and a statistics or research methods course is strongly recommended. A minimum GPA of 2.00 or higher is required in all coursework used for the minor.

Description of Courses**PSYCHOLOGY****PSYCH**

105 [SSCI] Introductory Psychology 3 Survey of the basic terms, processes, principles, and theories related to the scientific study of human behavior.

110 Introduction to Addiction Studies 3 Analysis of cultural, societal, individual, and physiological factors underlying drug addiction.

210 (310) Psychology as a Science 3 How psychology uses reasoning, skepticism, and the scientific method to evaluate claims made in everyday life.

230 Human Sexuality 3 Sexuality in personal development; personal, cultural, biological influences on sexual identification and behavior; fertility, reproduction, sexual functioning, sexuality and personality. (Crosslisted course offered as PSYCH 230, WOMEN ST 230). Recommended preparation: PSYCH 105.

265 Biopsychological Effects of Alcohol and Other Drugs 3 Biopsychological effects of the major classes of abused and psychotherapeutic drugs, including alcohol, stimulants, sedatives and hallucinogens. Recommended preparation: PSYCH 105; BIOLOGY 102, BIOLOGY 107, or BIOLOGY 101 and 105.

301 Seminar in Psychology V 1-3 May be repeated for credit; cumulative maximum 6 hours.

306 Industrial Psychology 3 Job analysis and evaluation; personnel recruitment and selection; design and evaluation of training systems; performance appraisals. Recommended preparation: PSYCH 105.

307 Human Factors 3 Human limitations and capabilities in architectural and engineering design; system analysis. Recommended preparation: PSYCH 105.

308 Organizational Psychology 3 Employee motivation satisfaction and commitment; organizational communication; leadership; group behavior, teams and conflict; organizational change and development. Recommended preparation: PSYCH 105.

309 Cultural Diversity in Organizations 3 Psychology applied to cultural diversity in organizations; interpersonal and intergroup relationships; diversity training; EEO legislation and affirmative action. Recommended preparation: PSYCH 105.

311 [QUAN] Elementary Statistics in Psychology 4 Course Prerequisite: ENGR 107, MATH 105, 106, 107, 108, 140, 171, 172, 202, 252, MGTOP 215, STAT 205, or STAT 212 with a grade of C- or better. Descriptive statistics, probability, and inference; design and interpretation of research. Recommended preparation: PSYCH 105.

312 [M] Experimental Methods in Psychology 4 (3-3) Course Prerequisite: PSYCH 210; PSYCH 311 with a grade of C- or better. Designing, conducting, and reporting research in selected areas of experimental psychology. Recommended preparation: PSYCH 105.

320 Health Psychology 3 Psychological and physiological aspects of stress; health behavior and disease prevention; adjustment to chronic illness. Recommended preparation: PSYCH 105.

321 Introduction to Personality 3 Theories, concepts, methods, discoveries in psychology of personality. Recommended preparation: PSYCH 105.

324 Psychology of Gender 3 Contemporary overview of the psychological theory and research on sex and gender. (Crosslisted course offered as PSYCH 324, WOMEN ST 324). Recommended preparation: PSYCH 105.

328 [M] Self Control 3 Analysis of self-control problems; application of behavioral principles to student-conducted projects. Recommended preparation: PSYCH 105.

333 Abnormal Psychology 3 Course Prerequisite: PSYCH 105. Problems of abnormality from traditional and evolving points of view; types, therapies, outcomes, preventive techniques.

342 Assessment and Treatment of Dual Diagnosis 3 Course Prerequisite: PSYCH 333. Development of conceptual frameworks to guide the treatment and research of patient's co-occurring chemical dependency and psychiatric disorders. Recommended preparation: PSYCH 105.

350 Social Psychology 3 Course Prerequisite: Sophomore standing. Attitude changes, conformity, interpersonal relations, groups and social influences explored to give a coherent view of social psychology. (Crosslisted course offered as PSYCH 350, SOC 350). Recommended preparation: PSYCH 105 or SOC 101.

361 Principles of Developmental Psychology 3 Introduction to biological and psychosocial influences on infant, child and adolescent development. Recommended preparation: PSYCH 105.

- 363 Psychology of Aging** 3 Psychological processes of aging; changes in sensory, motor, cognitive, motivational and personality characteristics; research methodologies for the study of aging. Recommended preparation: PSYCH 105.
- 372 [BSCI] Biological Basis of Behavior** 3 Course Prerequisite: Sophomore standing. Functional relationship between nervous system and behavior; integrated organ systems, sensory processes, and investigative procedures. Occasional lab meetings required; see instructor for times. Recommended preparation: PSYCH 105 or PSYCH 265; BIOLOGY 102, BIOLOGY 107, or BIOLOGY 101 and 105.
- 384 Sensation and Perception** 3 Perception of size, depth, form, shape; illusions, contrast; historical and modern theories and research; applications and demonstrations. Recommended preparation: PSYCH 105.
- 401 [M] Historical Development of Psychology** 3 Course Prerequisite: Certified major in Psychology; junior standing. Concepts, methods, theories, trends, and systems. Recommended preparation: PSYCH 105.
- 403 Cultural Issues in Psychology** 3 Multidisciplinary analyses of the relationship between social-ecological and political contexts and individual and collective psychology. (Crosslisted course offered as CES 403, PSYCH 403).
- 412 [CAPS] [M] Psychological Testing and Measurement** 3 Course Prerequisite: PSYCH 311; junior standing. Introduction to test and survey development in clinical, organizational, and educational settings; assessment of attitudes, personality, and behavior. Recommended preparation: PSYCH 105. Cooperative: Open to UI degree-seeking students.
- 440 [M] Clinical/Community Psychology** 3 Course Prerequisite: PSYCH 333; junior standing. Professional problems; theory, training, relations with clients, institutions, public. Recommended preparation: PSYCH 105.
- 442 Advanced Addiction Treatment Techniques** 4 (3-2) Course Prerequisite: PSYCH 342. Advanced addiction treatment approaches for individuals, couples, families and groups within a human services framework; integration of relapse prevention techniques. Recommended preparation: PSYCH 110.
- 444 Basic Helping Skills** 3 Course Prerequisite: 6 hours PSYCH. Training in basic skills to work with varied types of clients; didactic and role play instruction. Recommended preparation: PSYCH 105.
- 445 Undergraduate Practicum** V 1 (0-3) to 3 (0-9) May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: 6 hours PSYCH; junior standing. Supervised experience in local and county agencies; application of psychological principles to a variety of professional work settings. Recommended preparation: PSYCH 105; PSYCH 333; PSYCH 444. S, F grading.
- 464 Behavior Disorders of Children and Adolescents** 3 Course Prerequisite: PSYCH 361, HD 101, or HD 340. Theoretical and empirical approaches to the description, etiology, and treatment of behavior disorders in children and adolescents. Recommended preparation: PSYCH 105; PSYCH 333.
- 466 Environmental Psychology** 3 Psychological concepts applied to the mixture of positive and negative interactions individuals have with their physical environment. Recommended preparation: PSYCH 105.
- 468 Addictive Behavior Across the Demographic Spectrum** 3 Course Prerequisite: Junior standing. Overview of social, cultural and historical perspectives on dealing with addictive behavior. (Crosslisted course offered as SOC 468, CRM J 468, PSYCH 468). Recommended preparation: SOC 101, PSYCH 105, or CRM J 101.
- 470 Motivation** 3 Course Prerequisite: Junior standing. Different motivational systems; analysis of environmental and biological factors influencing motivation, with emphasis on human motivation. Recommended preparation: PSYCH 105; PSYCH 350, PSYCH 372, PSYCH 490, or PSYCH 491.
- 473 [M] Advanced Biological Basis of Behavior** 3 Course Prerequisite: PSYCH 372, or NEUROSCI 301. Neurophysiological, hormonal, and biochemical bases of regulatory behavior; theoretical and applied issues. Recommended preparation: PSYCH 105.
- 485 Gerontechnology I** 3 Course Prerequisite: Certified major in Computer Science or Psychology. Introduction to the field of gerontechnology, including aging and senses, mobility and exercise, data analysis, and research methods. (Crosslisted course offered as CPT S 485, PSYCH 485).
- 486 Gerontechnology II** 3 Course Prerequisite: Certified major in Computer Science or Psychology. In-depth exploration of gerontechnology, including socialization, caregiver issues, dementia, app design and data visualization. (Crosslisted course offered as CPT S 486, PSYCH 486).
- 490 Cognition and Memory** 3 Course Prerequisite: Junior standing. Human information processing, memory, and cognition. Recommended preparation: PSYCH 105.
- 491 Principles of Learning** 3 Course Prerequisite: Junior standing. Principles of learning from a behavioral perspective using the experimental analysis of behavior. Credit not granted for both PSYCH 491 and 591. Recommended preparation: PSYCH 105.
- 492 Psychology of Language** 3 The cognitive and neuropsychological processes involved in the acquisition and use of language; cross-cultural perspectives on language and thought.
- 495 Field Experience in Personnel Psychology** V 2 (0-6) to 6 (0-18) May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: MGTOP 450 or PSYCH 306. Supervised experience in local industries and organizations; application of personnel psychology and resource management principles to work environments. Recommended preparation: PSYCH 105. S, F grading.
- 496 Cooperative Education Internship** V 2-6 May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: PSYCH 445 or PSYCH 495. Off-campus cooperative education internship with business, industry, or government unit coordinated through the Professional Experience Program. Recommended preparation: PSYCH 105. S, F grading.
- 497 Instructional Practicum** V 1-4 May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: By permission only. S, F grading.
- 498 Research Participation** V 1-4 May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: By permission only. Participation in the current research of departmental faculty. S, F grading.
- 499 Special Problems** V 1-4 May be repeated for credit. Course Prerequisite: By permission only. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 502 Research Design** V 1-3 May be repeated for credit; cumulative maximum 16 hours. Course Prerequisite: Ph.D. student in Psychology. Research design, equipment, data collection, data analysis, and report writing. S, F grading.
- 504 History of Psychology: Theoretical and Scientific Foundations** 3 Course Prerequisite: Ph.D. student in Psychology. Roots of scientific explanation in psychology traced through various philosophical schools and psychological movements.
- 505 Teaching Introductory Psychology** V 1-3 May be repeated for credit; cumulative maximum 5 hours. Course Prerequisite: Ph.D. student in Psychology. Problems and techniques related to teaching introductory psychology. S, F grading.
- 506 Current Research in Psychology** 1 May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: Ph.D. student in Psychology. Current research being conducted by psychology faculty and members of associated departments. S, F grading.
- 508 Special Topics in Psychology** V 1-3 May be repeated for credit.
- 510 Introduction to Online Instruction** 1 Course Prerequisite: Ph. D student in Psychology. Instruction in teaching online courses addressing issues faced by instructors and students; students are mentored while teaching online. S, F grading.

- 511 Analysis of Variance and Experimental Design** 3 Course Prerequisite: Ph.D. student in Psychology or Business Administration. Parametric, nonparametric, repeated-measures, and multivariate ANOVA; planned comparisons; confidence intervals and power analysis; experimental design and variants.
- 512 Correlation, Regression, and Quasi-Experimental Design** 3 Course Prerequisite: Ph.D. student in Psychology or Business Administration. Simple and multiple correlation and regression; time-series analysis; factor analysis; field research and quasi-experimental design.
- 513 Seminar in Quantitative Methods and Research Design** 3 May be repeated for credit. Course Prerequisite: PSYCH 512. Advanced topics in specialized quantitative procedures and in design of research in psychology.
- 514 Psychometrics** 3 Course Prerequisite: PSYCH 512. Scientific construction of behavioral assessment instruments, including validation and reliability; types of scales and responses; statistical scaling; test theory issues.
- 515 Multilevel and Synthesized Data** 3 Course Prerequisite: PSYCH 512. Structural equation modeling, hierarchical linear modeling and meta-analysis and the software used to conduct these analyses.
- 516 Applied Structural Equation Modeling with Current Software** 3 Course Prerequisite: PSYCH 512; PSYCH 514. Confirmatory factor analysis, path analysis, structural regression analysis, multilevel analysis and latent growth analysis with current software.
- 519 Industrial/Organizational Psychology** 3 Course Prerequisite: Ph.D. student in Psychology. Overview of research, theory, and application of psychological principles in the workplace.
- 520 Empirical Approaches to Psychotherapy** 3 Course Prerequisite: PSYCH 533. Major therapy systems, research on process and outcome of therapy.
- 530 Professional, Ethical, and Legal Issues** 3 Course Prerequisite: Ph.D. student in Psychology. Application of professional, ethical, and legal issues in clinical psychology to such topics as confidentiality, dual-relationships, research, assessment, and intervention.
- 533 Adult Psychopathology** 3 Course Prerequisite: Ph.D. student in Psychology. Theoretical and empirical approaches to diagnosis, etiology and treatment of mental disorders. Cooperative: Open to UI degree-seeking students.
- 534 Clinical Psychopharmacology** 3 Course Prerequisite: PSYCH 533 or COUN PSY 517; PSYCH 574 or 575; Ph.D. student in Clinical or Counseling Psychology. Classification, clinical application, and mechanisms of psychotherapeutic drugs used in the treatment of mental disorders.
- 535 Personality Assessment and Diagnosis** 3 Course Prerequisite: Ph.D. student in Psychology. Diagnostic interviewing, conceptualization of clinical problems, case presentations, and treatment planning.
- 536 Measurement Theory and Personality Assessment** 3 Course Prerequisite: By interview only. Psychometric theory, theories of personality, objective and projective methods of assessing personality, development of testing and interpretive skills.
- 538 Child Therapy Practicum** 3 May be repeated for credit; cumulative maximum 18 hours. Course Prerequisite: Ph.D. student in Psychology. Supervised practice in the clinical application of psychology with children and families. S, F grading.
- 539 Intellectual and Neuropsychological Assessment** 3 Course Prerequisite: Ph.D. student in Psychology. Psychometric theory, theories of intelligence, methods of appraising intelligence in children and adults, and development of testing and interpretive skills.
- 542 Child and Adolescent Psychopathology** 3 Theoretical and empirical approaches to etiology and diagnosis of mental disorders in children.
- 543 Child Clinical Psychology: Empirical Approaches to Assessment and Therapy** 3 Course Prerequisite: Ph.D. student in Psychology. Research on child assessment and therapy.
- 544 Medical Psychology: Psychological and Pharmacological Interventions** 3 Course Prerequisite: Ph.D. student in Clinical or Counseling Psychology. Psychological factors and their influence upon the causes and/or course of medical illnesses as well as relevant clinical interventions. Cooperative: Open to UI degree-seeking students.
- 545 Psychology Clinic Assessment and Psychotherapy Practicum** 3 (0-9) May be repeated for credit; cumulative maximum 18 hours. Course Prerequisite: Ph.D. student in Psychology. Supervised practice in the clinical application of psychology with adults in the Psychology Clinic. S, F grading.
- 546 Counseling Service Practicum** V 1-3 May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: Ph.D. student in Psychology. Supervised practice in the clinical application of psychology at the WSU Counseling Service. S, F grading.
- 547 Medical Psychology Practicum** 3 May be repeated for credit; cumulative maximum 18 hours. Course Prerequisite: PSYCH 544; Ph.D. student in Clinical Psychology. Supervised practice in the clinical application of psychology at the WSU Health and Wellness Service. S, F grading.
- 548 Clinical Externship** V 1-3 May be repeated for credit; cumulative maximum 18 hours. Course Prerequisite: Ph.D. student in Psychology. Supervised practice in the clinical application of psychology at approved hospitals and medical practices. S, F grading.
- 550 Social Psychology** 3 Course Prerequisite: Ph.D. student in Psychology. Attitude structure, function, and change; social cognition and motivation, and attributions. Cooperative: Open to UI degree-seeking students.
- 552 Diversity Issues in Psychology** 3 Course Prerequisite: Ph.D. student in Psychology. Research, theories, and controversies regarding the role of human diversity in psychotherapy, psychological assessment, and clinical research.
- 574 Clinical and Experimental Biopsychology** 3 Course Prerequisite: Ph.D. student in Psychology. Neuroanatomical, neurochemical, and other biological cases of human and animal behavior. Cooperative: Open to UI degree-seeking students.
- 575 Foundations of Neuropsychology** 3 Course Prerequisite: Ph.D. student in Psychology. Foundations in brain/behavior relationships and neuropathological syndromes; preparation for advanced training in neuropsychological assessment. Cooperative: Open to UI degree-seeking students.
- 577 Behavioral Pharmacology** 3 Survey of drugs which affect brain function with emphasis on animal models and clinical applications. Recommended preparation: PSYCH 574 or NEUROSCI 520. Cooperative: Open to UI degree-seeking students.
- 584 Sensory Bases of Behavior** 3 Sensory and physiological aspects of vision, audition, and other senses. Cooperative: Open to UI degree-seeking students.
- 591 Principles of Learning** 3 Principles of learning from a behavioral perspective using the experimental analysis of behavior. Credit not granted for both PSYCH 491 and 591. Recommended preparation: PSYCH 105.
- 592 Cognition and Affective Basis of Behavior** 3 Course Prerequisite: Ph.D. student in Psychology. Experimental approaches to human information processing, memory, and cognition.
- 595 Clinical Internship in Psychology** V 2-16 May be repeated for credit; cumulative maximum 16 hours. Course Prerequisite: Ph.D. student in Psychology. Clinical training in an internship approved by American Psychological Association or by WSU. S, F grading.
- 600 Special Projects or Independent Study** V 1-18 May be repeated for credit. Course Prerequisite: Ph.D. student in Psychology. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination** V 1-18 May be repeated for credit. Course Prerequisite: Ph.D. student in Psychology. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

702 Master's Special Problems, Directed Study and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Ph.D. student in Psychology. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Psychology PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Department of Sociology

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Associate Professor and Department Chair, L. J. McIntyre; Professors, D. Dillman, C. Home, M. Johnson, J. Kmec, C. Mosher, T. Rotolo, A. Wharton; Associate Professors, A. MacLean, E. Johnson, J. Schwartz, J. Sherman; Assistant Professors, E. Huddard-Kennedy, K. Leupp; Instructor, S. Blake.

Sociology is the scientific study of social life. The fundamental insight of the discipline is that the social matters; our lives are affected not only by our personal psychology, but by our place in the social world.

Courses in sociology are designed to provide the student with an understanding of what makes people and groups of people behave the way they do. They cover a wide range of issues, from inequality to human ecology, from deviance to religion, from medicine to politics. Few fields offer students (and researchers) opportunities of such breadth. The course of study for majors is flexible enough to accommodate a variety of individual interests. Some knowledge of sociology is widely regarded as a useful supplement to the course work in most fields.

The department offers courses of study leading to the degrees of Bachelor of Arts in Sociology, Master of Arts in Sociology, and Doctor of Philosophy. It also offers an undergraduate minor in Sociology.

Undergraduate Studies

The undergraduate sociology major provides excellent preparation for careers in a variety of occupations, including public relations, teaching, positions in government, social agencies, and industry; or as a foundation for careers in professions such as community planning, counseling, law, medicine, the ministry, politics, or public administration.

Student Learning Outcomes

At the completion of the Bachelor of Arts degree in sociology, students will be able to 1) understand themselves in relationship to society, 2) understand the relationship between society and the physical world, 3) reason symbolically and quantitatively, 4) conduct/evaluate empirical research, 5) critically apply sociological concepts to "real world" situations, 6) understand how individual behavior and social institutions affect social order, 7) communicate effectively orally and in writing, 8) enhance life skills such as civility and cooperation, and 9) respect social diversity.

Degree Requirements

A Bachelor of Arts degree in sociology requires a minimum of 31 hours of sociology coursework in which students must maintain a C average. All majors must complete five required core courses as well as five elective courses in sociology. In addition, students must earn 24 credit hours in related fields, half of which must be in 300-400 level courses. Related field courses enable students to individualize their programs of study to best meet their academic and career goals. Students select related field courses from a departmentally approved list and in consultation with an academic advisor.

The following courses are required for all sociology majors: Introduction to Sociology (SOC 101), Development of Social Theory (SOC 310), Research Methods in Sociology (SOC 317 [M]), and a department approved course in statistics for the social sciences, SOC 321, and one of the following "capstone experience" integrative capstone courses: Capstone Internship (SOC 495), Capstone Service (SOC 496), or Capstone Research Practicum (SOC 497).

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

SOCIOLOGY (120 HOURS)

This is a prototype of one of many ways to complete the Bachelor of Arts in Sociology in four years. The program has built-in flexibility. Students should consult their advisors regarding other acceptable course plans.

Students must meet the graduation requirements of the College of Liberal Arts. They are encouraged to make a broad and balanced sampling of UCORE courses to meet the university's goal for a general education, as well as to explore or confirm possible major and career interests.

At least 40 of the 120 hours for the degree must be at the 300-400-level.

First Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
ENGLISH 101 [WRTG]	3
Quantitative Reasoning [QUAN]	3
SOC 101 [SSCI]	3
Foreign Language, if necessary, or Elective	4

<i>Second Term</i>	<i>Hours</i>
Communication [COMM] or Written Communication [WRTG]	3
HISTORY 105 [ROOT]	3
Humanities [HUM]	3
Foreign Language, if necessary, and/or Electives	5

Second Year

<i>First Term</i>	<i>Hours</i>
Biological Sciences [BSCI] with lab or SCIENCE 101 [SCI] ¹	4
Creative & Professional Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
Diversity [DIVR]	3
Electives	6

<i>Second Term</i>	<i>Hours</i>
Physical Sciences [PSCI] with lab or SCIENCE 102 [SCI] ¹	4
SOC Elective ²	3
Electives	9
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
Related Field Electives ³	6
SOC 310	3
SOC 317 [M]	3
SOC Elective ²	3

<i>Second Term</i>	<i>Hours</i>
Related Field Electives ³	6
SOC 321	4
SOC Elective ²	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
300-400-level Related Field Electives ³	9
SOC Elective ²	3
Electives	3

<i>Second Term</i>	<i>Hours</i>
SOC 495 [CAPS] [M], 496 [CAPS] [M], or 497 [CAPS] [M]	3
300-400-level Related Field Electives ³	9
300-400-level Electives	3

¹To meet University and College of Arts and Sciences requirements, students must take a [BSCI] course with lab and [PSCI] course with lab or SCIENCE 101 [SCI] and SCIENCE 102 [SCI]. SCIENCE 101 [SCI] is offered Fall semester and is a prerequisite for SCIENCE 102 [SCI]. SCIENCE 102 [SCI] is offered Spring semester.

² SOC Electives: Any SOC course except SOC 320. Must include sufficient 300-400-level courses to meet University Requirement of 40 credits of Upper Division coursework.

³ Related Field Electives: 24 credits required. At least 12 credits must be at the 300-400 level. Approved courses include COM 101, 410, 440, 464, 470, COMSOC 230, 321, 421, COMSTRAT 312, 380, CPT S 401, ENVR SCI 101, I BUS 380, MGMT 301, MIL SCI 201, 202, 301, 302, 401, 402, MKTG 360, NATRS 312, and any AMER ST, ANTH, ASIA, CES, CRMJ, ECONS, H D, HISTORY, HONORS, PHIL, POL S, PSYCH, and WOMEN ST courses.

Minors

Sociology

The minor in sociology may be certified after completion of 60 semester hours. It requires a minimum of 18 credit hours in sociology, including SOC 101, 320, and at least 9 additional graded hours of 300-400-level courses taken in residence at WSU or through WSU-approved education abroad or educational exchange courses. Any SOC course may be counted toward the minor (subject to the above provisions). Only 3 credits of SOC 495 may apply to the minor. A GPA of 2.0 is required for the minor.

Description of Courses

SOCIOLOGY

SOC

- 101 [SSCI] Introduction to Sociology 3** Introduction to the discipline of sociology: Concepts and methods used in the inquiry into the social world.
- 102 [SSCI] Social Problems 3** The structure of social institutions and cultural factors that constitute threats to society (crime, poverty, discrimination, drugs, family violence).
- 245 Sociology of Sport 3** Sociological study of sport in America.
- 250 Perspectives on Disability 3** Historical, international, socioeconomic, ethical and personal perspectives on disability; individual choices, societal values, and social responsibility.
- 251 The Sociology of Sex, Relationships, and Marriage 3** Social and personal factors in mate selection; the sociology of sexuality; development of gender roles; and intimate relationships and marriage. (Crosslisted course offered as SOC 251, WOMEN ST 251).
- 300 [DIVR] [M] Intersections of Race, Class, Gender and Sexuality 3** Course Prerequisite: CES 101, 201, SOC 101, WOMEN ST 101, or 201. Intersections between race, class and gender through case studies; experiences in interdisciplinary methods. (Crosslisted course offered as WOMEN ST 300, CES 300, SOC 300).
- 302 Contemporary Masculinities 3** Analysis of the development of masculinity in its biological and cultural forms. (Crosslisted course offered as WOMEN ST 302, CES 305, SOC 302).
- 310 Development of Social Theory 3** Foundations of sociological theory; introduction to original works of early social theorists. Recommended preparation: SOC 101.
- 317 [M] Research Methods in Sociology 3** Designing, conducting, and reporting social research.
- 320 Introduction to Social Research 3** Methods of collecting data; surveys, experiments, field observations; organization and interpretation of data; reading social research findings.
- 321 Quantitative Techniques in Sociology I 4** Levels of measurement; measures of central tendency, dispersion and association; normal curve, statistical inference; logic of quantitative comparison and decision making.
- 331 Population, Resources, and the Future 3** Effects of population on resource depletion, environmental deterioration, social and economic structure; zero population growth prospects; limits to growth debate.
- 332 [SSCI] Society and Environment 3** Society-environment relations, including environmental attitudes and behavior; the environmental movement and environmental politics and policy-making. Recommended preparation: SOC 101.
- 333 Science, Power and Human Values 3** Recent developments in the sociological study of science and scientific knowledge through cultural, commercial, and political perspectives.
- 334 Issues in Global Human Health 3** Human populations and life expectancies; inequity across global regions.
- 340 [DIVR] Social Inequality 3** Causes and consequences of social inequality in contemporary America. Recommended preparation: SOC 101.
- 342 Urban Poverty 3** Historical context and current debates on US urban poverty including public policy, employment and education, and gender, race, and ethnicity. Recommended preparation: SOC 101.
- 343 Sociology of Professions and Occupations 3** Social organization of work in America including historical and contemporary trends, bureaucracy, gender/racial inequality, technological affects, work/family relations. Recommended preparation: SOC 101.
- 346 Sociology of Education 3** Examination of how educational institutions are influenced by other social forces, how school practices affect individual outcomes and how race/class/gender shape educational opportunity. Recommended preparation: SOC 101.
- 347 Sociology of Race, Ethnicity, and Immigration 3** Racial and ethnic categories and experiences of specific racial, ethnic, and immigrant groups.
- 350 Social Psychology 3** Course Prerequisite: Sophomore standing. Attitude changes, conformity, interpersonal relations, groups and social influences explored to give a coherent view of social psychology. (Crosslisted course offered as PSYCH 350, SOC 350). Recommended preparation: PSYCH 105 or SOC 101.
- 351 [DIVR] The Family 3** Family system and its interaction patterns; family formation and dissolution; marital and partner relations, divorce, sexuality, parenting, work-family balance. (Crosslisted course offered as SOC 351, WOMEN ST 351). Recommended preparation: SOC 101.
- 356 Sociology of Aging and the Life Course 3** Aging as a lifelong process; behavior, personality competencies, social relations changes over the life course; historical, social structural, demographics, contextual influences. Cooperative: Open to UI degree-seeking students.
- 360 Social Deviance 3** A survey of the sociology of deviance. Recommended preparation: SOC 101.
- 361 Criminology 3** Crime measurement, the correlates of crime, and specific types of crime such as white-collar and drug crime. Recommended preparation: SOC 101.
- 362 Juvenile Delinquency 3** Sociological perspectives on delinquency; delinquent gangs and subcultures; delinquency causation and control; law and its enforcement: juvenile justice and corrections. Recommended preparation: SOC 101.
- 367 Juvenile Justice and Corrections 3** Course Prerequisite: CRM J 101. History, philosophy, legal process, performance, and outcomes of the juvenile justice and corrections systems. (Crosslisted course offered as CRM J 365, SOC 367). Cooperative: Open to UI degree-seeking students.
- 368 Sociological Theories of Addictive Behavior 3** Alcohol use and abuse in the context of other legal and illegal substances focusing on theories and drug policies. Recommended preparation: SOC 101.
- 372 The Sociology of Film 3** The social, economic, and political factors that influence film production and the impact of films on American culture.
- 373 Media, Culture, and Society 3** The production of popular culture by media organizations and its effects on society.
- 375 Aspects of Sustainable Development 3** Course Prerequisite: ECONS 101 or 198. Ecological, economical, and sociological aspects of sustainable development. (Crosslisted course offered as ECONS 326, SOC 375).
- 384 Sociology of Gender 3** Construction and maintenance of gender and gender inequality in American society. (Crosslisted course offered as SOC 384, WOMEN ST 384). Recommended preparation: SOC 101.
- 390 Gender and Work 3** Gender and inequality at work including occupational segregation, wage inequality and balancing work and family. (Crosslisted course offered as SOC 390, WOMEN ST 390).
- 391 Special Topics in Sociology V 1-3** May be repeated for credit; cumulative maximum 6 hours.
- 392 Special Topics V 1-3** May be repeated for credit.
- 415 [CAPS] Globalization 3** Course Prerequisite: Junior standing. Structural foundations of global social change; theories of intersocietal interactions and interdependencies. Recommended preparation: SOC 101.

- 418 Human Issues in International Development** 3 Interdisciplinary analysis of complex interaction between tradition and modernity in Third World societies. (Crosslisted course offered as ANTH 418, POL S 418, SOC 418).
- 421 Quantitative Techniques in Sociology II** 3 Probability theory, sampling distributions, random variables, matrix approaches to statistical techniques, calculus for statistics and computer applications.
- 430 Society and Technology** 3 Course Prerequisite: Junior standing. Role of technology in social evolution; social impacts and shaping of technology. Recommended preparation: SOC 101.
- 433 Urbanization and Community Organization** 3 Course Prerequisite: Junior standing. Organization, function, change, development, and decline of communities; applications emphasizing rural or urban settings. Recommended preparation: SOC 101.
- 461 Corrections** 3 Course Prerequisite: Junior standing. History, facilities, processes, strategies for the correction and punishment of offenders, analysis of concepts of prevention and control of crime. Recommended preparation: SOC 101.
- 468 Addictive Behavior Across the Demographic Spectrum** 3 Course Prerequisite: Junior standing. Overview of social, cultural and historical perspectives on dealing with addictive behavior. (Crosslisted course offered as SOC 468, CRM J 468, PSYCH 468). Recommended preparation: SOC 101, PSYCH 105, or CRM J 101.
- 474 Collective Behavior and Social Movements** 3 Course Prerequisite: Junior standing. Processes of collective behavior and social movements in historical and contemporary societies. Recommended preparation: SOC 101.
- 484 [DIVR] Introduction to Lesbian, Gay, Bisexual, and Transgender Studies** 3 Course Prerequisite: Junior standing. Interdisciplinary exploration of issues related to gender and sexuality, explored transhistorically and cross-culturally, including race, class and age differences. (Crosslisted course offered as WOMEN ST 484, SOC 484).
- 491 Advanced Special Topics** V 1-3 May be repeated for credit; cumulative maximum 6 hours.
- 493 Internship** V 1-6 May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: By permission only. Work experience related to undergraduate major and career interests. S, F grading.
- 495 [CAPS] [M] Internship Capstone** 3 Course Prerequisite: SOC 310 or concurrent enrollment; junior standing. Self-initiated supervised work experience in an approved campus or community setting. Recommended preparation: SOC 317 or 320, and Soc 321 or CRM J 321.
- 496 [CAPS] [M] Capstone - From Theory to Practice: The Sociology of Service** 3 Course Prerequisite: SOC 310 or concurrent enrollment; junior standing. Service learning course connecting theoretical solutions to social problems with service in community organizations.
- 497 [CAPS] [M] Capstone Research Practicum** 3 Course Prerequisite: SOC 317 or concurrent enrollment; certified major in sociology. Hands-on experience in selection of social problem, review of literature, identifying data sources, developing methodology and reporting results.
- 498 Research Assistantship** 3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: By permission only. Supervised experience in current research by departmental faculty.
- 499 Special Problems** V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 510 Development of Social Theory** 3 Examination of the foundations of social theory.
- 511 Data Management** 3 Core concepts and procedures regularly used in the quantitative analysis of sociological data.
- 517 Seminar in Contemporary Sociological Theory** 3 Recent developments in sociological theory, analysis, application and appraisal of specific theoretical systems. Cooperative: Open to UI degree-seeking students.
- 519 International Development and Human Resources** 3 History of and recent changes in international development emphasizing anthropological perspectives. (Crosslisted course offered as ANTH 519, POL S 538, SOC 519).
- 520 Research Methods in Sociology** 3 Methodology of social research at the professional level.
- 521 Regression Models** 3 Simple and multiple regression, structural equation models, nonlinear applications, applications for discrete dependent variables.
- 522 Advanced Sociological Methodology** 3 May be repeated for credit; cumulative maximum 12 hours. Scaling theory, sampling theory, experimental design, measurement of association, multivariate analysis, current methods and techniques. Recommended preparation: SOC 521.
- 523 Qualitative Methods Practicum** 3 Introduction to qualitative research methods as used in social sciences; epistemological underpinnings and empirical techniques. Recommended preparation: SOC 520.
- 525 Practicum in Survey Research** 3 Practical experience in design and implementation of telephone and mail surveys; participation in all aspects of conducting a survey. Recommended preparation: SOC 520.
- 526 Experimental Methods** 3 May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: SOC 521. Experimental methods including design and analysis, settings, manipulations, measures and human subjects considerations.
- 530 Demography** 3 Population studies; causes, effects, and measurement of changes in fertility, mortality, and migration; population estimation and projection.
- 531 Human Ecology** 3 Ecosystem context of human life; change viewed ecologically; sociological use and misuse of ecological concepts; issues in theory and research.
- 532 Environmental Sociology** 3 Societal-environmental interactions; impacts of human societies on the physical environment; environmental impacts on human behavior and social organization.
- 535 Technology and Society** 3 Analysis of sociotechnical systems; effects of technology on society; the social shaping of technologies and their environmental impacts.
- 536 Special Topics in Environmental Sociology** V 1 (0-3) to 3 (0-9) May be repeated for credit; cumulative maximum 9 hours. Special topics in environmental sociology.
- 542 Social Stratification: Class, Race and Gender Inequalities** 3 Theoretical and empirical research in both classic stratification literature and recent scholarship on class, race/ethnicity and gender.
- 545 Sociology of Community** 3 Community stability and change: interaction processes; decision making; societal linkages; effects on well-being.
- 553 Social Organization and the Family** 3 The family as a social institution; principles of social organization applied to family relationships; macro-level analyses of family structure.
- 554 Social Psychology of the Family** 3 The family as an interacting group; social psychological theories and research applied to family relationships; effects of families on individuals.
- 556 Sociology of Aging and the Life Course** 3 Theory and research on the changes individuals undergo over the life course; influences of history, social structure, agency and social relations on lives.
- 574 Labor Market Inequality** 3 Overview of research on the causes and consequences of inequality in U.S. work organizations.
- 580 Sociology of Race Relations** 3 Analysis of race/ethnic relations; historical and current theoretical explanations of race/ethnic relations.
- 582 Social Movements** 3 Theories and methods in social movement studies.
- 590 Special Topics in Sociology** 3 May be repeated for credit; cumulative maximum 9 hours.
- 591 The Sociology Profession** 1 May be repeated for credit; cumulative maximum 2 hours. Requirements, operations, problems, and possibilities of the sociology profession. S, F grading.

592 Special Topics in Sociology 3 May be repeated for credit; cumulative maximum 9 hours.

593 Special Topics in Sociology V 1-3 May be repeated for credit; cumulative maximum 6 hours. Special topics in sociology.

600 Special Projects or Independent Study V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.

700 Master's Research, Thesis, and/or Examination V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

702 Master's Special Problems, Directed Study, and/or Examination V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Sociology PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Department of Speech and Hearing Sciences

medicine.wsu.edu/speechandhearing/
Spokane
509-358-7602
speechhearing@wsu.edu

Professor and Department Chair, G. D. Chermak; Associate Professors, E. Inglebret, N. Potter; Assistant Professors, G. Lynch, L. Swineford, M. VanDam; Clinical Professors, A. Meredith, L. Power; Clinical Assistant Professor, K. Simpson; Instructors, K. Jones, M. Ratsch; Professors Emeriti, C. L. Madison, R. E. Potter.

The Department of Speech and Hearing Sciences in the Elson S. Floyd College of Medicine offers courses of study leading to the degrees of Bachelor of Arts in Speech and Hearing Sciences and Master of Science in Speech and Hearing Sciences. Training in speech and hearing sciences through the bachelor's level

degree is considered a pre-professional degree. State and national clinical and educational certifications and licensure require completion of the master's degree. The graduate program in speech-language pathology is accredited nationally by the Council on Academic Accreditation of the American Speech-Language-Hearing Association and recognized at the state level by the Washington State Board of Education.

Academic course work and clinical practicum offerings prepare professional personnel to meet the diagnostic and therapy needs of individuals of all ages evidencing a wide variety of speech, language, hearing and learning problems.

Graduate students are prepared as speech-language pathologists to provide direct and consultative services in education and medical settings. The course of study emphasizes the physiological, neurological, psychological, and behavioral processes of normal development, the fundamental communication process, and the disorders of communication. The analytic and independent application of course content to the clinical process is encouraged.

The undergraduate and graduate programs, located in the Health Sciences Building on the Washington State University Health Sciences Spokane campus, are cooperative ventures, combining faculty and resources of Washington State University and Eastern Washington University to form University Programs in Communication Disorders (UPCD). WSU students enroll through and receive their degrees from Washington State University. The Hearing and Speech Clinic is the Spokane campus graduate training facility for the University Programs in Communication Disorders. Opportunities to work with special populations and in medical settings are readily available for graduate students in the Spokane area. A capstone graduate internship program provides intensive practical experience in many clinical and educational settings. Contact: speechhearing@wsu.edu and speech.hear.grad@wsu.edu

Student Learning Outcomes

A graduate of the bachelor's Speech and Hearing Sciences program will be able to: 1) identify needs or issues in clinical service delivery; 2) identify contextual factors to consider in addressing clinical service delivery needs/issues; 3) identify and consider various perspectives important to analysis of the needs/issues and underlying assumptions associated with each; 4) identify and assess the quality of evidence supporting particular service delivery practices; 5) identify and assess conclusions, implications, and consequences associated with examination of the needs/issues; 6) Provide informed leadership to achieve desired social outcomes.

Learning outcomes for students in Speech and Hearing Sciences master's program reflect the knowledge and skills competencies required by the American Speech-Language-Hearing Association. Students earning a master's degree will be able to demonstrate: 1) knowledge of the basic human communication and swallowing processes; 2) knowledge of the nature of speech, language, hearing, and communication disorders and differences, and swallowing disorders; 3) knowledge of the principles and methods of prevention, assessment, and intervention for people with communication and swallowing disorders; 4) knowledge of standards of

ethical conduct; 5) knowledge of the processes used in research and the integration of research principles into evidence-based clinical practice; 6) knowledge of contemporary professional issues; 7) skills in screening, evaluation and prevention procedures; 8) skills in developing, implementing, and monitoring appropriate intervention plans with measurable and achievable goals that meet clients'/patients' needs.

Preparation for Graduate Study

Students with undergraduate majors in human development, linguistics, education, psychology, and other social and behavioral sciences, as well as those with undergraduate majors in speech and hearing sciences, may be accepted for graduate study in this department. Those with majors in areas other than speech and hearing sciences may be required to take undergraduate prerequisite coursework prior to taking graduate coursework.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

SPEECH AND HEARING SCIENCES (120 HOURS)

Certification Requirements:

Given the rigorous nature of the coursework and the need to prepare students for work in a pre-professional role or to prepare them for the competitive demands of applying to graduate school in the discipline, students must meet the following minimum requirements to be eligible to certify a major in Speech and Hearing Sciences: 1) Have earned a minimum of 24 credits of undergraduate credits; 2) Have taken, or currently enrolled in, SHS 205, Introduction to Speech-Language Pathology & Audiology; 3) minimum cumulative GPA of 2.75.

At least 45 of the total hours required for the bachelor's degree in this program must be in 300-400-level courses. Successful completion of SHS 473 [M] and 482 [M] fulfills the university requirement of two writing in the major courses.

The Speech and Hearing Sciences Department provides preparation for professional (graduate) training as a speech-language pathologist or audiologist. This course sequence is based on fall enrollment. UCOREs must be completed prior to the fifth semester.

First Year

First Term	Hours
BIOLOGY 102 [BSCI] or 106 [BSCI]	4
Communication [COMM] or Written Communication [WRTG]	3
Diversity [DIVR]	3
HISTORY 105 [ROOT]	3
PSYCH 105 [SSCI]	3

Second Term	Hours
ENGLISH 101 [WRTG]	3
PHYSICS 101 [PSCI] or CHEM 101 [PSCI]	4
SHS Elective ¹	3
STAT 212 [QUAN]	4

Second Year

<i>First Term</i>	<i>Hours</i>
Creative & Professional Arts [ARTS]	3
SHS 205	3
SHS Electives ¹	6
Electives	3
<i>Second Term</i>	<i>Hours</i>
Humanities [HUM]	3
SHS Electives ¹	6
Electives	6
Complete Writing Portfolio	-

Third Year

<i>First Term</i>	<i>Hours</i>
SHS 371	3
SHS 372	3
SHS 375	3
SHS 377	3
Electives	3
<i>Second Term</i>	<i>Hours</i>
SHS 376	3
SHS 378	3
SHS 472	3
SHS 478	3
Electives	3

Fourth Year

<i>First Term</i>	<i>Hours</i>
SHS 201	4
SHS 477	3
SHS 479	3
SHS 482 [M]	3
SHS Electives ¹	2
<i>Second Term</i>	<i>Hours</i>
SHS 202	4
SHS 451	3
SHS 461	2
SHS 473 [M]	3
SHS 480 [CAPS]	3

¹ SHS electives (17 credits required) include any H D or PSYCH course 200-level or above, or as approved by advisor.

Description of Courses**SPEECH AND HEARING SCIENCES****SHS**

- 201 American Sign Language I** 4 Instruction and practical training in sign language for communication with persons who are deaf; deaf culture; beginning conversation skills.
- 202 American Sign Language II** 4 Course Prerequisite: SHS 201 or concurrent enrollment; completion of SHS 201 recommended. Sign language systems; vocabulary and skill development in signing and interpreting signs; intermediate conversation skills.
- 205 Introduction to Speech-Language Pathology and Audiology** 3 Overview of deficits of speech, language, and hearing and the role of speech-language pathologist and the audiologist.

371 Language Development 3 Normal development of the cognitive, linguistic, and pragmatic components of language; introduction to language disorders in children.

372 Hearing and Hearing Disorders 3 Acoustic and psychophysiological aspects of normal hearing and speech perception, and the nature and consequences of hearing disorders.

375 Phonetics 3 Description and classification of American English speech sounds; practice using the International Phonetic Alphabet to transcribe normal and disordered speech sounds.

376 Speech Sound Disorders 3 Course Prerequisite: SHS 375. Clinical phonetics and transcription; evaluation and treatment of articulatory disorders; delayed phonological acquisition; dysarthria; and dyspraxia.

377 Anatomy and Physiology of the Speech Production 3 Anatomical and physiological basis of speech production and the pathologies and aberrations that require the services of a communication disorders specialist.

378 Speech and Hearing Sciences 3 Course Prerequisite: SHS 377. Basis of acoustics, acoustic phonetics, psychoacoustics, speech production, speech perception, and instrumentation for measurement of related phenomena.

450 Special Topics in Speech and Hearing Sciences V 1-3 May be repeated for credit; cumulative maximum 9 hours. Study of specialized topics in speech and hearing sciences.

451 Neurogenic Communication Disorders 3 Course Prerequisite: SHS 479. Introduction to the etiology, assessment and intervention of communication disorders associated with neurological disorders.

460 Special Topics in Speech and Hearing Sciences V 1-3 May be repeated for credit; cumulative maximum 9 hours. Study of specialized topics in speech and hearing sciences.

461 Clinical Methods 2 Course Prerequisite: Concurrent enrollment in SHS 480 or SHS 478. Pre-practicum preparation; observation of and assisting in therapy; state laws; clinical methods.

471 Speech-Language Pathology and Audiology in Schools 2 Therapy methods and procedures in speech-language pathology and audiology; state/federal laws affecting public school therapy.

472 Audiometry 3 Course Prerequisite: SHS 372. Principles and procedures in basic identification and assessment of hearing impairment; introduction to differential diagnosis of auditory pathologies.

473 [M] Language and Literacy 3 Diagnosis and remediation of language and learning disabilities in individuals manifesting disorders in understanding or using spoken/written language.

477 Aural Rehabilitation 3 Theories and methods in aural rehabilitation for persons who are hearing-impaired; amplification; educational audiology; counseling techniques.

478 Language Impairment 3 Course Prerequisite: SHS 371. Assessment and habilitation for the preschool and elementary-age child with language disorders.

479 Neuroanatomy 3 Neuroanatomical and neurophysiological bases of speech production and audition; neuropathologies of speech, language, and audition.

480 [CAPS] Senior Seminar 3 Course Prerequisite: Senior standing. Synthesis of theory and evidence underlying professional principles and practices inclusive of multicultural populations in speech-language pathology and audiology.

482 [M] Assessment of Speech and Language 3 Course Prerequisite: SHS 376 or concurrent enrollment; and SHS 478. Principles, techniques, and materials involved in exploring the nature of speech and language disorders; planning programs of therapy.

490 Special Topics in Speech and Hearing Sciences V 1-3 May be repeated for credit; cumulative maximum 9 hours. Study of specialized topics in speech and hearing sciences.

499 Special Problems V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.

501 Research Methods 3 Philosophy of research, types of literature; experimental and descriptive designs; application of statistics; analysis of statistical results.

540 Special Topics in Speech and Hearing Sciences V 1-3 May be repeated for credit; cumulative maximum 9 hours. Advanced study of specialized topics in speech and hearing sciences. SHS graduate student; all undergraduate prerequisite courses completed.

542 Infant and Toddler Communication and Language 3 Typical development of communication and language in the birth to 5 year-old population; impairments affecting development; disorders; assessment; intervention. SHS graduate student; all undergraduate prerequisite courses completed.

543 School Age and Adolescent Language 3 Language development in typically developing and language impaired school age and adolescent students; disorder types; implications for assessment and intervention. SHS graduate student; all undergraduate prerequisite courses completed.

545 Autism Spectrum Disorder 2 Course Prerequisite: SHS 542. Overview and discussions of the characteristics, causes, assessments, and interventions for autism spectrum disorder.

- 550 Special Topics in Speech and Hearing Sciences** V 1-3 May be repeated for credit; cumulative maximum 9 hours. Study of specialized topics in speech and hearing sciences. SHS graduate student; all undergraduate prerequisite courses completed.
- 556 Problems in Stuttering** 2 Historical and current literature; problem-solving strategies applied to theoretical and clinical problems in stuttering. SHS graduate student; all undergraduate prerequisite courses completed.
- 557 Cleft Palate and Craniofacial Disorders** 2 Speech and voice problems associated with clefts of the lip and palate. SHS graduate student; all undergraduate prerequisite courses completed.
- 560 Special Topics in Speech and Hearing Sciences** V 1-3 May be repeated for credit; cumulative maximum 9 hours. Advanced study of specialized topics in speech and hearing sciences. SHS graduate student; all undergraduate prerequisite courses completed.
- 562 Motor Speech Disorders** 3 Underlying processes of neuromuscular control and feedback; results of damage and disease on neuromotor system. SHS graduate student; all undergraduate prerequisite courses completed.
- 563 Dysphagia** 3 Anatomy and physiology of swallowing; evaluation and treatment of swallowing disorders. SHS graduate student; all undergraduate prerequisite courses completed.
- 565 Augmentative Communication** 3 Augmentative communication theory; implementation, training strategies, ongoing adjustments, and evaluating effectiveness. SHS graduate student; all undergraduate prerequisite courses completed.
- 566 Off-Campus Practicum Public School Setting** V 2 (0-6) to 6 (0-18) May be repeated for credit; cumulative maximum 15 hours. Course Prerequisite: SHS 575. Advanced clinical practice in a public school setting; evaluation and treatment of speech, language, and hearing disorders. SHS graduate student; all undergraduate prerequisite courses completed. S, F grading.
- 567 Issues in Public School Service Delivery** 3 Clinical operations, policies, procedures, including legal, ethical, and professional considerations in the schools. SHS graduate student; all undergraduate prerequisite courses completed.
- 568 Off-campus Practicum Clinical Setting** V 2 (0-6) to 6 (0-18) May be repeated for credit; cumulative maximum 15 hours. Course Prerequisite: SHS 575. Advanced clinical practice in an off-campus clinical/medical setting; evaluation and treatment of speech, language and hearing disorders. S, F grading.
- 570 Advanced Internship in Speech-Language Pathology** V 1-18 May be repeated for credit. Course Prerequisite: SHS 566 or SHS 568. Advanced practicum in diagnosis of and therapy for communication disorders. SHS graduate student; all undergraduate prerequisite courses completed. S, F grading.
- 574 Neuropathologies of Language** 3 Advanced study of language disorders resulting from brain insult after birth; emphasis on aphasia and related disorders. SHS graduate student; all undergraduate prerequisite courses completed.
- 575 Advanced Clinical Practice** V 2-6 May be repeated for credit; cumulative maximum 15 hours. Advanced clinical practice in evaluation and treatment of speech, language, and hearing disorders. SHS graduate student; all undergraduate prerequisite courses completed.
- 576 Voice Disorders** 2 Functional and organic voice disorders resulting from various etiologies. SHS graduate student; all undergraduate prerequisite courses completed.
- 580 Special Topics in Speech and Hearing Sciences** V 1-3 May be repeated for credit; cumulative maximum 9 hours. Advanced study of specialized topics in speech and hearing sciences. SHS graduate student; all undergraduate prerequisite courses completed.
- 587 Speech-Language Pathology in the Medical Setting** 2 Report writing and charting, collaborating with the medical team, establishing prognosis and assessing efficacy of treatment, and third-party reimbursement. SHS graduate student; all undergraduate prerequisite courses completed.
- 588 Phonological Acquisition and Behavior** 3 Current literature in articulatory development and deviancy; diagnosis and therapy. SHS graduate student; all undergraduate prerequisite courses completed.
- 590 Special Topics in Speech and Hearing Sciences** V 1-3 May be repeated for credit; cumulative maximum 9 hours. Advanced study of specialized topics in speech and hearing sciences. SHS graduate student; all undergraduate prerequisite courses completed.
- 600 Special Projects or Independent Study** V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination** V 1-18 May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

- 702 Master's Special Problems, Directed Study, and/or Examination** V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

Statistics

Please see the Department of Mathematics and Statistics in this catalog for information about Statistics.

Department of Teaching and Learning

education.wsu.edu/tl/
Cleveland 321
509-335-6842

Interim Chair and Associate Professor, T. Akmal; Professors, J. M. Canty, J. L. Egbert, G. Ernst-Slavit, S. Finley, S. Kruse, S. B. Kucer, L. Mabry, D. Miller, T. Nelson, A. R. McDuffie, A. G. Rud, R. D. Sawyer, D. Slavitt; Associate Professors, S. R. Banks-Joseph, P. J. Bettis, A. Cavagnetto, D. Day-Wiff, M. Dunn, E. J. Johnson, J. E. Kelley, J. Morrison, P. Groves Price, T. L. Salisbury; Assistant Professors, Y. Ardasheva, B. Barrio, D. Chakraverty, A. J. Firestone, A. Guerrettaz, Y. Hsiao, M. Kelton, K. Lesseig, J. Lupinacci, D. McMahon, S. Newcomer, K. Puzio, S. Rakha; Clinical Faculty, A. Chang, J. Frost, L. D. Hall, M. Moscatelli, S. Petersen, M. Poppen, B. A. Ward, T. F. Watson; Instructors, B. Baird, M. H. Bates, W. T. Doenecke, J. Jensen, J. Johnson, C. Lueth, N. McKibbin, D. Pastore, M. K. Rygg, G. Pitzer, S. E. Skavdahl, C. O. Sodorff, L. White; Professors Emeriti, M. Roe, B. Romanish; Associate Professors Emeriti, A. R. Laguardia, P. Mills.

Courses of study (availability differs across campuses) are offered for elementary school teaching (Bachelor of Arts in Education, Master in Teaching) and secondary school teaching (degree from major plus certification, Master in Teaching). Additional endorsements are offered in Special Education, English Language Learners/Bilingual Education, Reading, Middle Level Math, and Middle Level Science. Graduate programs include Master of Arts in Education, Masters of Education, Masters in Teaching, Doctor of Education, and Doctor of Philosophy. Doctoral specializations are available in these areas: Cultural Studies and Social Thought in Education (Ph.D.); Language, Literacy, and Technology (Ph.D.); Mathematics/Science Education (Ph.D.); and Special Education (Ph.D.).

Department of Teaching and Learning faculty contribute to the theory and practice of the broad field of education, and dedicate themselves to understanding and respecting learners in diverse cultural contexts. They facilitate engaged learning and ethical leadership in schools and clinical settings. They seek collaboration with diverse

constituencies, recognizing their local and global responsibilities to communities, environments, and future generations.

Student Learning Outcomes

Faculty seek the following learning outcomes for students in teacher education: graduates will (1) use content and pedagogical knowledge to inform their teaching, (2) develop relevant, rigorous, and developmentally appropriate curricula, (3) modify curriculum and instruction based on the individual needs of their students, (4) use assessment of their students' learning and their own teaching to inform future planning and teaching, (5) attend to the social and civic development of their students, and (6) work respectfully and collaboratively with colleagues to ensure quality instructional programs and stewardship of public schools. At the master's level, graduates will (1) locate, analyze, and synthesize research literature, and apply that synthesis to problems of practice, (2) effectively communicate scholarly work through written, oral, and/or alternate formats, (3) skillfully inquire into areas of program-related interest, (4) develop scholarly habits of curiosity, inquiry, skepticism, and data-based decision making, and (5) demonstrate professional habits of respect, accept and use feedback, and consider others' ideas and perspectives. Doctoral students will achieve master's level outcomes and also will: (1) conduct and disseminate original scholarship that demonstrates acquisition and application of new knowledge and theory, (2) visit our website experts in their area of study. Visit our website at <https://education.wsu.edu/formsanddeadlines/>.

The Washington State University annual report on teacher education, required under Title II, Section 207(f)(2) of the Higher Education Act, is available upon request. Visit our web site at <https://education.wsu.edu/titleii/>

TEACHER CERTIFICATION

The Department of Teaching and Learning prepares individuals to teach elementary education, and various single subjects at the secondary education level. The teaching certificate, awarded by the State Superintendent of Public Instruction upon recommendation by Washington State University, designates the subject area in which the certificate holder is qualified to teach. Candidates seeking a B.A. in Education must also complete 20 hours in an endorsable area (e.g., English Language Learning, Special Education, Middle Level Math, Middle Level Science, Reading, etc.) pursuant to WAC 181-79A-030 (8). Admission to the teacher education programs at all campuses is selective. Teacher education is offered at the Pullman, Spokane, Tri-Cities, and Vancouver campuses, although not all programs are available at each site.

The teaching certificate will be awarded if the following provisions are met:

- The candidate provides evidence of good character and personal fitness to teach. Fingerprinting is required. A background investigation is conducted by the Washington State Patrol, the FBI, and Office of Professional Practices.
- The degree is awarded and the professional education program is satisfactorily completed following these guidelines:
- All course work is taken for a letter grade where offered. Pass, Fail grading is not accepted except for field experience courses.

- The candidate has earned no grade lower than C (2.0) for professional course work, and course work in the endorsements. The C minimum grade also applies to general education, math, science, and social studies requirements in the elementary program.

- The cumulative WSU GPA and the GPA computed separately for professional course work and each endorsement is not less than 2.75 for Health and Fitness and 2.5 for all other areas.
- The student has completed all work within five years of admission to teacher education. Those not finishing within this time limit will be subject to all new program requirements.
- The candidate has achieved a passing score on the statewide examinations in basic skills (WEST-B, SAT, or ACT), content (WEST-E or NES), and on all cross-campus assessments.
- The candidate has met the Professional Dispositions Assessment standards.
- The candidate has successfully passed the state-mandated Teacher Performance Assessment (edTPA).

Transfer students entering an undergraduate or post baccalaureate certificate program must complete at least fifty percent of the professional education core, and, if preparing to teach at the elementary level, fifty percent of the elementary endorsement course work, plus student teaching at WSU. Transfer students and post baccalaureate applicants should consult with an advisor regarding equivalency and transferability of course work.

Opportunities are provided for teacher certificate candidates to gain meaningful experiences by working directly with and observing children in school settings. It is WSU's intent to place only those individuals in K-12 classrooms that are able to demonstrate a positive impact on student learning, and to insure that they possess those characteristics desirable for working with children and young people. The College of Education therefore reserves the right to refuse placement of any student in a field experience, or to terminate an individual's placement if in the professional judgment of the faculty, the hosting school, or coordinating field personnel there is cause for concern about the fitness of that individual to work with children in a classroom setting. The student teaching field placement is arranged by the faculty with school districts contracted to provide experiences for WSU students. Students do not make their own student teaching placements. Student teaching must be completed at an approved WSU site in the state of Washington or internationally with supervision by an approved WSU provider.

Certificate Renewal, Continuing Certificate, Add-On Endorsements

<https://education.wsu.edu/certification/>

Information is available upon request from the Certification Coordinator, College of Education, PO Box 642114, Pullman, WA 99164-2114 (509) 335-8146 or sbickel@wsu.edu.

Professional Certificate

The ProTeach Support Program is offered at the Spokane and Tri-Cities campuses. Online and district partnerships are offered through the Pullman campus. Information is available upon request from the College of Education, PO Box 64 2132, Pullman, WA 99164- 2132, (509) 335- 7475, and on regional campus web sites.

WSU PULLMAN/SPOKANE TEACHER CERTIFICATION

Inquiries and requests for program information should be addressed to Office of Undergraduate Student Services, College of Education, PO Box 642152, Pullman WA 99164-2152 (509) 335-4855 or beateacher@wsu.edu or visit our website at <https://education.wsu.edu/teachered/>.

WSU Pullman seeks to prepare the best possible teachers and therefore seeks highly qualified individuals. Admission to, or continued enrollment in, the teacher education program may be denied a candidate on the basis of review by the faculty. To prepare in elementary education the candidate shall satisfy degree requirements of the Department of Teaching and Learning. To prepare in a single subject, the candidate shall complete the baccalaureate degree/teaching option offered through the subject matter department, or in general studies. Single-subject endorsement preparation is available in Agriculture, Biology, Chemistry, Earth and Space Science, English Language Arts, World Languages (French and Spanish), Health and Fitness, History, Family and Consumer Sciences, Mathematics, Music, Physics, and Social Studies. Add-on endorsements for pre-service teachers are offered in English Language Learners, Middle Level Math, Middle Level Science, Reading, Science, and Special Education. Candidates holding single-subject endorsements typically will be assigned to teach in grades 5-12 except those endorsed in ELL, World Languages, Health and Fitness, Music, Reading, or Special Education who are authorized to teach P-12. Specific course requirements for endorsements are listed in the subject matter of the catalog. Endorsement requirements are subject to change by the Professional Educator Standards Board.

Admission to Undergraduate and Post baccalaureate Teacher Education

Applicants who meet the minimum requirements are eligible for consideration, but not assured admission. Enrollment is limited and admission competitive. Admission deadlines are September 30 and February 28 or 29 with admission effective the following term. Candidates must complete formal admission procedures and be admitted to teacher education prior to taking any professional education course work beyond TCH LRN 301, 307, or 317. The following minimum criteria must be met for consideration for admission:

Minimum Criteria

Contact Office of Undergraduate Student Services at 509-335-4855 or beateacher@wsu.edu for up-to-date information.

- Completion, within the last three years, of 80 hours of supervised work with children 4 years of age or older in a supervised setting.
- Basic skills proficiency in reading, writing, and mathematics. Students may use SAT, ACT, or WEST-B scores to meet the basic skills requirement. For information go to: <https://education.wsu.edu/basicskillstesting>.
- Completion of at least 45 semester hours of post-secondary course work.
- Minimum WSU cumulative GPA of 2.50 for elementary and secondary applicants. Health and Fitness educational applicants must have a minimum WSU cumulative GPA of 2.75 (transfer student GPA is based on WSU course work).

- TCH LRN 301 graded C or better.
- Elementary Majors: H D 101, MATH 251, and three of the four required UCORE science courses, all graded C or better.
- Secondary Majors: Nine hours of course work in the endorsement area. Certified in major department. Contact major department for additional requirements.
- Personal goal statement.
- Interview and writing sample.

Field Experiences and Student Teaching

Washington State University requires background clearance for all students admitted into the undergraduate teacher education, Master in Teaching (MIT), and selected add-on endorsement programs. Secondary single subject majors must make application for student teaching one full academic year prior to the actual student teaching semester. Elementary majors make application for advanced practicum placement one year prior to the advanced practicum semester. Fingerprint and background clearance is required for enrollment in TCH LRN 402, 405, 415, 469, 490, 593, and 595. Application forms are distributed at an orientation held each semester. An interview is required to begin student teaching. The following courses are required field experiences:

Elementary majors enroll in TCH LRN 402, Instructional Practicum I (1 credit); TCH LRN 405, Instructional Practicum II (1 credit); TCH LRN 490, Advanced Practicum (3 credits). Elementary majors enroll concurrently in the required practicum for the appropriate block. TCH LRN 402 and 405 involve participation in a school setting to apply concepts learned in blocked courses. Practicum placement and activities are arranged by the course instructors and the Field Experience Office. TCH LRN 490 is an extended 4-week, full-time practicum in a school setting one semester prior to student teaching. Placement is arranged by the Department of Teaching and Learning. Secondary majors enroll in TCH LRN 317, Initial Practicum Experience (2 credits) and TCH LRN 469, Advanced Field Experience (2 credits). TCH LRN 317 is a three-week, full-time experience completed in May at the end of the sophomore year or prior to enrollment in Block I classes, in a public or private school in the student's home community. TCH LRN 469 is a 12-week, 6 hrs/week experience in local schools arranged by the Department of Teaching and Learning during the semester prior to student teaching. All practica involve observation, reflection, and practice in classrooms.

TCH LRN 415, Student Teaching (16 credits), is a semester of full-time teaching in a public school, arranged by university personnel. Agricultural Education, Family Consumer Sciences and Music majors enroll concurrently in TCH LRN 415 and the appropriate student teaching course in the major. Prior to student teaching the certificate candidate will: interview; satisfactorily complete all course work for the degree and teacher certificate; obtain a passing score on the content exam (NES or WEST-E); receive fingerprinting clearance from the Washington State Patrol, the FBI, and the Office of Professional Practices. Student teaching must be completed at an approved WSU site in the state of Washington or internationally with supervision by university personnel.

TCH LRN 593 Pre-Internship (2 credits) requires

successful completion of MIT summer courses, enrollment in concurrent fall coursework and fingerprinting clearance from the Washington State Patrol, the FBI and the Office of Professional Practices.

TCH LRN 595 Internship (10 credits) requires successful completion of TCH LRN 593 and concurrent coursework, application and payment of certification fee and a passing score on the NES or WEST-E content examination.

The Pre-Internship and Internship are arranged by university personnel and must be completed at an approved WSU site in the state of Washington with supervision by university personnel.

Master in Teaching (MIT)

The Master in Teaching degree program is a full-time, field-based program leading to elementary or secondary teacher certification and a master's degree. Students in this program will complete certification courses during the first 15 months of the program. With successful completion of these requirements, students may opt to complete additional research requirements for a master's degree. Applicants must have a bachelor's degree from an accredited institution with a minimum 3.0 cumulative GPA. Applications for Elementary Education and Secondary Education must be submitted by November 15 for programs beginning the following summer. All applicants must demonstrate basic skills proficiency in reading, writing and math to be considered for admission. Students may use SAT, ACT, or WEST-B scores to meet the basic skills requirement. Information about minimum admission requirements may be obtained from the College of Education Office of Graduate Studies 509-335-9195 or gradstudies@wsu.edu or <http://education.wsu.edu/graduate>. For additional information about certification issues contact the Certification Coordinator at sbickel@wsu.edu or visit them online at <https://education.wsu.edu/certification/>.

Course of Study for Elementary Education (50 hrs): ED AD 506, ED PSYCH 503, 504, KINES 586, SPEC ED 520, TCH LRN 502, 505, 517, 525, 540, 552, 556, 564, 572, 593, 594, 595, 600, 702.

Course of Study for Secondary Education (46 hrs): ED AD 506, ED PSYCH 503, 504, TCH LRN 522, TCH LRN 528, TCH LRN 513, SPEC ED 520, TCH LRN 502, 505, 517, 525, 593, 595, 600, 702, and an additional 9 credits of graded course work.

WSU PULLMAN/SPOKANE MASTERS' DEGREES (non-certification)

Master of Arts in Education

WSU Pullman/Spokane offers a Master of Arts in Education degree (M.A.) program with specialization and/or endorsement in Curriculum and Instruction, ELL/Bilingual Education, Literacy Education, and/or Special Education. Students planning to add an endorsement to a Washington teacher certificate must apply to WSU's add-on endorsement program. This thesis degree focuses on developing research and inquiry skills and other professional knowledge and skills in education and leadership and may include a concentration of coursework outside the Department of Teaching and Learning.

Master of Education Degree (Ed.M.)

WSU Pullman/Spokane also offers a Master of Education degree (Ed.M.) program specialization

and/or endorsements in Curriculum and Instruction, Language and Literacy Education, Special Education, and/or ELL/Bilingual Education. Students planning to add an endorsement to a Washington teacher certificate must apply to WSU's add-on endorsement program. This non-thesis degree focuses on developing K-12 teachers' or other professionals' knowledge and skills in education and leadership and may include a concentration of coursework outside the Department of Teaching and Learning.

WSU PULLMAN/SPOKANE DOCTORAL PROGRAMS

Doctor of Philosophy in Education (Ph.D.)

(Pullman only) Specializations include Cultural Studies and Social Thought in Education, Language, Literacy and Technology, Mathematics/Science Education, and Special Education (see <http://education.wsu.edu/graduate/> for program descriptions and application procedures).

Doctor of Education (Ed.D.)

The statewide Doctor of Education (Ed.D.) with a specialization in Teacher Leadership is located within the Department of Educational Leadership, Sports Studies, and Educational/Counseling Psychology. The Teacher Leadership emphasis in the Ed.D. is designed to prepare K-16 teachers and teacher leaders for intellectual and practical leadership within classrooms, schools, districts, and the larger educational policy arena. Faculty in the Department of Teaching and Learning participate in this program, and serve as advisors to enrolled students. The program is built on an inquiry stance: students draw from theory, research, and practical experiences to investigate local and statewide teaching and learning programs and practices. The program is cohort-based and requires attendance at three summer sessions (two of which occur on the Pullman campus). Some courses will be delivered face-to-face at each campus. Others are delivered using distance technology (on-line and/or video-conferencing). Participants must have access to the internet and to a computer with sufficient bandwidth to allow for on-line course delivery. The program is designed for completion within four years including summers, as a part-time student.

See the full description of the Ed.D with a specialization in Teacher Leadership located in the Department of Educational Leadership, Sports Studies, and Educational/Counseling Psychology.

WSU TRI-CITIES TEACHER CERTIFICATION

<https://education.wsu.edu/certification/>
<http://tricities.wsu.edu/education>

Inquiries and requests for application materials should be addressed to WSU Tri-Cities, Department of Teaching and Learning, 2710 University Drive, Richland WA 99354-1671, (509) 372-7396.

WSU Tri-Cities seeks to prepare the best possible teachers and therefore seeks highly qualified individuals. Admission to, or continued enrollment in, the teacher education program may be denied on the basis of review by the faculty.

Bachelor of Arts

Applicants to the bachelor of arts program with elementary certification at the Tri-Cities campus who meet the minimum requirements are eligible

for consideration, but not assured admission. Enrollment is limited and admission is competitive. The admission deadline is March 1 with admission effective for Fall semester. Candidates must complete formal admission procedures and be admitted to teacher education prior to taking any professional education coursework beyond TCH LRN 301. Applicants must meet the admission criteria listed for WSU Pullman, with the exception that a timed writing sample is not required as part of the interview process. TCH LRN 301 may not be required for program admission by transfer students who are admitted to the program before they begin taking classes at WSU. TCH LRN 301 must be taken in the first semester of the program by these students in order to remain eligible for the major.

Teacher Professional Certification Program

Washington State University Tri-Cities (WSUTC) has a quality, established support program. WSU's Teacher Pro Certification Support Program consists of two courses: the Pre-Assessment Seminar (TCH LRN 541) and the Culminating Seminar (TCH LRN 543). Each course runs for the duration of the WSU semester (15 weeks). Instructors generally meet once a week, for three hours. Cohorts are currently scheduled in the Kennewick, Richland, Pasco, and North Franklin school districts. Additionally, these courses can be taken either for graduate credit (3 credits each course) or as a non-credit course (\$500/each course). The curriculum is the same regardless of which option is selected.

Master of Education (Ed.M.)

Washington State University Tri-Cities offers the Master of Education (Ed.M.) degree with specializations in Literacy, ELL/Bilingual, and Curriculum and Instruction. The Ed.M. is a non-thesis degree designed for educators wishing to extend their professional knowledge and enhance their competence as practitioners. Course credit also may be used to meet continued certification requirements or lead to a Reading, Special Education, Bilingual Education, and/or English Language Learner endorsement. Students planning to add an endorsement to a Washington teacher certificate must apply to WSU's add-on endorsement program. For additional information about certification issues please contact the Department of Teaching and Learning, WSU Tri-Cities.

WSU VANCOUVER TEACHER CERTIFICATION

<http://education.vancouver.wsu.edu/teacher-certification-programs>

Inquiries and requests for application materials for teacher certification programs should be addressed to WSU Vancouver, Education Department, 14024 NE Salmon Creek Avenue, Vancouver WA 98686, (360) 546-9673, or by email at admissions@vancouver.wsu.edu.

WSU Vancouver seeks to prepare the best possible teachers and therefore seeks highly qualified individuals for admission to the Bachelor of Arts in Education and the Master in Teaching programs. Admission to, or continued enrollment in, a teacher education program may be denied a candidate on the basis of review by the faculty. Field experiences with accompanying seminars allow the intern-cooperating partners to engage in ongoing

dialogue with university field personnel throughout the year and are coordinated with academic work.

Bachelor of Arts in Education

This Teacher Education Program culminates in a bachelor's degree with elementary certification. The program is designed for students who have a direct transfer Associate of Arts degree or who have completed 60 semester hours of study and who have also completed the required program prerequisites. Students can obtain a list of the prerequisites by contacting the Education Department at (360) 546-9673. All applicants must meet basic skills requirements (SAT, ACT, or WEST-B) test to be considered for admission. Students must be admitted to both WSU and the Teacher Education Program before beginning education classes. Students are admitted and begin classes only during the summer session.

Master in Teaching (MIT)

The Master in Teaching is a full-time, 15-18 month field-based program leading to elementary or secondary certification and a master's degree. Applicants must have a bachelor's degree from an accredited institution with a minimum 3.0 GPA in the last 60 semester hours of graded course work, and submit the MIT application portfolio which is available from the WSU Vancouver Education Department. All applicants must meet basic skills requirements in reading, writing and mathematics (SAT, ACT, or WEST-B) and content proficiency (NES or WEST-E) to be considered for admission. Applications are available in the summer and must be submitted by October 1 for secondary certification in order to be considered for the program beginning in January; December 1 is the deadline for application for elementary certification in order to be considered for the program beginning the following May.

Course of Study for Elementary Education (53 hours): ED AD 506, 510, ED PSYCH 503, 504, KINES 586, SPEC ED 520, TCH LRN 521, 522, 525, 540, 552, 556, 564, 572, 583, 593, 594, 595, 600, 702.

Course of Study for Secondary Education (37-51 hrs): ED AD 506, 510, ED PSYCH 503, 504, SPEC ED 520, TCH LRN 522, 528, 513, 502, 503, 505, 517, 525, 593, 594, 595, 600, 702.

WSU VANCOUVER IN SERVICE AND MASTERS' DEGREE PROGRAMS (NON-CERTIFICATION)

Inquiries and requests for application materials should be addressed to WSU Vancouver, Education Department, 14024 NE Salmon Creek Avenue, Vancouver, WA 98686, (360) 546-9075, or by email at admissions@vancouver.wsu.edu.

Endorsement Program

WSU Vancouver is proud to offer a number of endorsements for certified teachers to add to their credential. Use these endorsements to open new doors of opportunity for you within your school district or to help you gain employment for the first time. In addition to the traditional route of taking classes and an exam to add an endorsement, we also offer the Pathway 2 alternative route for certain endorsements. Check with our local advisor for more information on this route. Some of our endorsements may also be obtained in conjunction with a master's degree. Others are strictly "non-degree" endorsements.

Endorsements offered as either non-degree or with a Master of Education (Ed.M.): English Language Learners, Reading, Middle Level Mathematics, and Special Education. Endorsements offered only as non-degree: Biology, Early Childhood Education, English/Language Arts, History, Mathematics, Science, and Social Studies.

Master of Education Degree (Ed.M.)

WSU Vancouver also offers a Master of Education degree (Ed.M.) program with course work leading to endorsements in Reading, Special Education, Middle Level Mathematics, and/or ELL/Bilingual Education for educators who already have a teaching certificate. This non-thesis degree focuses on K-12 developing teachers' or other professionals' knowledge and skills in education and leadership.

WSU VANCOUVER DOCTORAL DEGREES

Doctor of Education in Teacher Leadership

The statewide Doctor of Education (Ed.D.) with a specialization in Teacher Leadership is located within the Department of Educational Leadership, Sports Studies, and Educational/Counseling Psychology and designed to prepare K-16 teachers and teacher leaders for intellectual and practical leadership within classrooms, schools, districts, and the larger educational policy arena. Faculty in the Department of Teaching and Learning participate in this program, and serve as advisors to enrolled students. The program is built on an inquiry stance: Students draw from theory, research, and practical experiences to investigate local and statewide teaching and learning programs and practices. The program is cohort-based and requires attendance at three summer sessions (two of which occur on the Pullman campus). Some courses will be delivered face-to-face at each campus. Others are delivered using distance technology (on-line and/or video-conferencing). Participants must have access to the internet and to a computer with sufficient bandwidth to allow for on-line course delivery. The program is designed for completion within four years including summers, as a part-time student. See the full description of the Ed.D. with a specialization in Teacher Leadership at <http://education.wsu.edu/graduate/specializations/teacherleadership/>.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

ELEMENTARY EDUCATION TEACHER CERTIFICATE (128 HOURS)

Candidates for the undergraduate elementary education teacher certificate program will satisfy degree requirements of the Department of Teaching and Learning. The degree will be the Bachelor of Arts. The student should include the following course work within UCORE selections to satisfy prerequisite, degree, and admission to teacher preparation requirements. This course schedule does not include an add-on endorsement.

During the freshman year, students must qualify to enroll in MATH 251, and begin the University Writing Portfolio.

First Year

<i>First Term</i>	<i>Hours</i>
ENGLISH 101 [WRTG]	3
H D 101 [SSCI]	3
MATH 251	3
MUS 153 [ARTS] or Creative & Professional Arts [ARTS]	3
SCIENCE 101 [SCI]	4

<i>Second Term</i>	<i>Hours</i>
Endorsement Course ¹	3
HISTORY 105 [ROOT]	3
HISTORY 110 [HUM] or 111 [HUM]	3
MATH 252 [QUAN]	3
SCIENCE 102 [SCI]	4

Second Year

<i>First Term</i>	<i>Hours</i>
Endorsement Course ¹	3
ENGLISH 201 [WRTG]	3
GEOLOGY 101	4
POL S 101 [SSCI] or ECONS 102 [SSCI]	3
TCH LRN 301	3
Complete WEST-B (if minimum required scores on SAT or ACT are not met)	

<i>Second Term</i>	<i>Hours</i>
BIOLOGY 102 or 106	4
Endorsement Courses ¹	6
HISTORY 120 [DIVR]	3
TCH LRN 307	3
Certify in Major	
Complete Writing Portfolio	

Third Year

<i>First Term</i>	<i>Hours</i>
ED PSYCH 401	3
TCH LRN 320 or 321	3
TCH LRN 352	3
TCH LRN 402	1
TCH LRN 445	2
TCH LRN 483 ²	3

<i>Second Term</i>	<i>Hours</i>
Endorsement Course ¹	3
TCH LRN 306 [M] or 322 [M]	3
TCH LRN 310 [M]	2
TCH LRN 371	3
TCH LRN 390	3
TCH LRN 405	1

Fourth Year

<i>First Term</i>	<i>Hours</i>
Endorsement Course ¹	3
SPEC ED 420	3
TCH LRN 330	3
TCH LRN 385	3
TCH LRN 413	3
TCH LRN 490 [CAPS]	3

<i>Second Term</i>	<i>Hours</i>
TCH LRN 415	16

¹ Endorsement Courses: Students seeking a BA in Elementary Education must complete at least 20 credit hours in an endorsable area. See Specific Subject area requirements.

² TCH LRN 483 must be completed prior to the Fourth Year.

SPECIFIC SUBJECT TEACHER CERTIFICATE

Candidates for specific subject certificates shall declare a major with the subject-matter department and meet the UCORE and degree requirements of that department. Students completing subject-specific endorsements will follow the Secondary Professional Education Core: ED PSYCH 468, TCH LRN 301, 317, 464, 465, 466, 467, 469, 470 and 415 unless admitted to the MIT program.

In addition to meeting requirements of the degree-granting department, the student must meet admission requirements and make formal application to the teacher education program prior to enrolling in any professional education courses beyond TCH LRN 301 and 317. It is recommended that candidates begin professional education courses in the sophomore or junior year to meet sequencing requirements. Students should include the following courses within UCORE selections to fulfill prerequisite and admission to teacher preparation program requirements: ENGLISH 101 and one of the following: ENGLISH 201, 301, 302, or 402. All courses taken for teacher certification must be completed with a C (2.0) or better.

Schedules of Studies for specific subjects teaching plans can be found in the subject area.

SPECIFIC SUBJECT AREA REQUIREMENTS

Agricultural Education: AFS 101, 201, 401; ANIM SCI 101; CROP SCI 360; CROP SCI/HORT 102; ECONS 350 or 352; AG ED 407, 440, 450, 471; AGTM 201, 402; SOIL SCI 201; plus 9 additional 300-400-level credits in agriculture system-based electives selected with adviser approval; and 3 credits AFS core system elective. A valid first aid card is required for Career and Technical certification.

Biology: BIOLOGY 106, 107, 301, 372, 405, 430, 499; CHEM 105, 106, 345; MBIOS 303, 305, 306; MATH 140 or 171; PHYSICS 101 or 201; PHYSICS 102 or 202; STAT 212, 412, or PSYCH 311; one from HISTORY 381, 382, SOC 430 or HONORS 390; 9 credits approved biological sciences electives.

Chemistry: BIOLOGY 106, 107; CHEM 105, 106 or 116, 220, 222, 345, 348; one from HISTORY 381, 382, 483, SOC 430, or HONORS 390; MATH 140 or 171; MBIOS 303, 304; PHYSICS 101 or 201, 102 or 202; SCIENCE 430; STAT 212, 412 or PSYCH 311; plus an additional 7 credits 300-400-level CHEM including CHEM 331 or MBIOS 465, and at least 4 credits from CHEM 333, 335, 347, 398, 425, 426, 495 or 499.

Designated World Languages French: FRENCH 204, 306, 307, 308, or 408; two from FRENCH 120, 320, 420; one from FRENCH 310, 350, 361; FOR LANG 440, 441; approved internship in French or study abroad in Francophone country at the advanced level.

Designated World Languages Spanish: SPANISH 204, 306, 307, 308, 407, 408; one from FOR LANG 101, 110, 120, 130, 220; two from SPANISH 310, 311, 320, 321, 350, 351, 361; two from SPANISH 450, 451, 452, 453; FOR LANG 440, 441.

Earth and Space Science: GEOLOGY 101 or 102 (102 preferred), 206, 210, 315, 340, 350, 499; MATH 140 or 171; PHYSICS 101, 102; CHEM 105, 106; BIOLOGY 106; ASTRONOM 345; ENVR SCI 174; one from HISTORY 381, 382, 483, SOC 430 or HONORS 410; SCIENCE 430; one from STAT 212, 412, or PSYCH 311; 6 credits 300-400-level electives

(geology elective, geomorphology, or oceanography recommended).

English Language Arts: ENGLISH 301 or 302; one from ENGLISH 368, 371, 372, 470, 472, 480, 481, 482; one from ENGLISH 332 (with advisor approval), 338 (with advisor approval), 366, 370, 373, 419, 483, 484, 485, 486, 487, 488, 489; HUMANITY 303, 304, 335, 338, 350, 410, 450; ENGLISH 305 or 306; one from ENGLISH 309, 311 314, 315, 317, 321, 322, 332 (with advisor approval), 338 (with advisor approval), 341, 345, 409; ENGLISH 323, 324, 325, 326; nine credits of ENGLISH or HUMANITY electives, with 3 credits of 100-200-level electives allowed except for transfer students who will be allowed 9 credits of 100-200-level electives.

Family and Consumer Sciences: AG ED 440; two from AMDT 210, 211, 417; BIOLOGY 140; HBM 258; HD 201, 202, 203, 204, 302, 310, 320, 350, 406, 407, 410, 479, 480.

Health and Fitness: One from BIOLOGY 106, 140, 251; CHEM 101 or 105; KINES 361, 484, 393, 481, 483; KINES 199, 262, 264, 266, 311, 312, 361, 380, 393, 461, 462, 481, 483, 484; PE ACTIV 112, 114, 132, 120/121, individual team PE ACTIV; PSYCH 230.

History: ECONS 102; POL S 101; HISTORY 101, 102, 110, 111, 120, 300, 422, 469, 480; one HISTORY from two separate categories: 1) 230 or 231, 2) 270 or 271, 3) 272 or 273, 4) 275; one from HISTORY 411, 413, 414, 415, 416; one from HISTORY 412, 417, 418, 419; 6 credits 300-400-level HISTORY electives which must include one European and one global non-western course.

Mathematics: MATH 171, 172, 216, 220, 273, 300, 301, 330, 360, 398, 403, 431, 432, 320 or 421; PHYSICS 201.

Music Education Endorsements General Requirements: Each endorsement below requires the passing of a piano proficiency examination, an upper-division exam, a solo half-recital, a 2.5 GPA and a grade of C or better in all music courses. If the requirements listed below along with the graduation requirements of the College of Arts and Sciences are met, the degree will be Bachelor of Music.

Music Education - Choral/Instrumental/General Endorsement: MUS 164, 251, 252, 253, 254, 351, 352, 353, 354, 359, 360, 361, 455, 480, 482, 483, 487, 488, 489, 490, 491, 493, 494, 497. Performance Studies: 14 credits of which 2 credits must be at the 400-level. Include a minimum of 2 credits in choral and 2 credits in performing groups. Performance Groups: 7 credits (minimum of 1 credit during each of seven semesters) to include at least one semester of MUS 435 for instrumentalists and MUS 428 for vocalists.

Music Education - Choral/General Endorsement: MUS 164, 251, 252, 253, 254, 351, 352, 353, 354, 359, 360, 361, 455, 480, 482, 483, 488, 489, 490, 491, 497. Performance Studies: 14 credits of which 2 credits must be at the 400 level. Performance Groups: 7 credits (minimum of 1 credit during each of seven semesters) to include at least 1 credit of MUS 428.

Music Education - Instrumental/General Endorsement: MUS 164, 251, 252, 253, 254, 351, 352, 353, 354, 359, 360, 361, 455, 480, 482, 483, 487, 490, 491, 493, 494, 497. Performance Studies: 14 credits of which 2 credits must be at the 400 level. Performance Groups: 7 credits (minimum of 1 credit during each of seven semesters) to include at least 1 credit of MUS 435.

Physics: ASTRONOM 345; BIOLOGY 106; CHEM 105, 106; one from HISTORY 381, 382, 483; SOC 430, or HONORS 390; MATH 171, 172, 220, 273, 315; PHYSICS 201 or 205, 202 or 206, 303, 304, 410, 415 or 514; 499 (4 credits hours includes observing PHYSICS 101 and 102); SCIENCE 430; one from STAT 212, 412 or PSYCH 311; two from PHYSICS 320, 330, 341.

Social Studies: ECONS 102; HISTORY 101, 102, 110, 111, 120, 422, 480 and 12 credits of upper-division history electives w/advisor approval that must include a non-western, a European, a U.S. History, and an elective; POL S 101; SOC 101; one from ANTH 101, 198, 203, 260; one from ECONS 404, 428, 430; one HISTORY from two separate categories: 1) 230 or 231, 2) 270 or 271, 3) 272 or 273, 4) 275; one from HISTORY 319, 495, ANTH 309; one from HISTORY 469, SOC 320; one from POL S 300, 316, 427, 450, 455, CRMJ 320; one from ANTH 307, 316, 320, 330, 331, 350, PSYCH 310, 324, 361, 470, SOC 320, 351, 384, 430.

ADD-ON ENDORSEMENTS

Anyone wishing to add an endorsement to a valid Washington State teacher certificate must make application to the WSU add-on endorsement program. The application and more information can be found on the College of Education's website (<http://education.wsu.edu/studentservices/endorsements>). The following endorsements are available as add-on endorsements only. Individuals may be recommended for endorsement in bilingual education, English Language Learners, reading, middle level science, middle level mathematics, science, or special education concurrently with completion of endorsement requirements in elementary education or one of the specific subject endorsements listed above, or as an endorsement added to a currently valid teacher certificate.

Bilingual Education: TCH LRN 333 or 510, 339 or 549, 401 or 501, 409 or 509, 411, 413 or 414 or 514; one from ENGLISH 256 or TCH LRN 330, 404, 504 (highly recommended), 512, 516, 537, 574, 580. Demonstrated proficiency in a language other than English by passing the oral and written proficiency tests of the American Council on the Teaching of Foreign Language (ACTFL) at the advance mid-level.

English Language Learners [undergraduate level]: TCH LRN 333, 339, 401, 413 or 414, and 409. One from ENGLISH 256 or TCH LRN 330, 404, 504 (highly recommended), 512, 516, 537, 574, 580.

English Language Learners [graduate level]: TCH LRN 501, 509, 510, 514, 549; one from TCH LRN 512, 516, 504, (highly recommended), 537, 574 or 580.

Middle Level Math: MATH 106, 252, 303, 351; TCH LRN 426 or 533, 427 or 534 approved probability and statistics course.

Middle Level Science: CHEM 101, BIOLOGY 107, PHYSICS 150, SCIENCE 430, TCH LRN 304.

Reading [graduate level]: TCH LRN 528, 537, 544, 546, 551, 553, 558.

Science: The candidate must complete a full endorsement in biology, chemistry, physics, or earth and space science, plus the following courses, if not included in the full endorsement: one 3-4 credit Astronomy course; CHEM 345; two from GEOLOGY 102, 210, 323 or 390; BIOLOGY 107.

Special Education [undergraduate level]: SPEC ED 301, 401, 402, 403, 404, 409, 421, 440, 470, 490 or 499 (4 credits).

Special Education [graduate level]: SPEC ED 301, 501, 502, 503, 504, 509, 521, 540, 571, 590 or 499 (4 credits).

Certificates

English Language Learners

The Certificate in English Language Learners requires a minimum of 18 hours. The 15 hour core is: TCH_LRN 333, 339, 401, 409, 413/414. 3 hours of electives are selected from TCH_LRN 404, 519, 516, or courses in other programs that are approved by the ELL Program Coordinator. A grade of C or better must be earned in all classes that apply towards this certificate. Few of the courses required for this certificate have prerequisites, but teaching experience or education classes are recommended.

Description of Courses

SPECIAL EDUCATION

SPEC ED

301 Education of Exceptional Children 3 Survey of characteristics of students with disabilities, and overview of programming, legal aspects, and methods of instruction.

401 Teaching Students with Disabilities 3 Course Prerequisite: SPEC ED 301 or 420. Intervention and instructional strategies for managing academic, social, and behavior problems in classroom settings. Credit not granted for both SPEC ED 401 and SPEC ED 501. Required preparation must include completion of an introductory special education course, or SPEC ED 520.

402 Assessment and Curriculum for Students with Disabilities 3 Course Prerequisite: SPEC ED 301; SPEC ED 404; concurrent enrollment in 2 credits of SPEC ED 490. Methods of individual and group, formal and informal assessment for students with disabilities. Credit not granted for both SPEC ED 402 and SPEC ED 502. Graduate level required preparation must include completion of an introductory special education course, or SPEC ED 520; SPEC ED 504; concurrent enrollment SPEC ED 590 (2 credits).

403 Secondary Education for Students with Disabilities 3 Course Prerequisite: SPEC ED 301 or 420; SPEC ED 404. Overview of instruction and intervention strategies for secondary students with disabilities; assessment, and curriculum/program development. Credit not granted for both SPEC ED 403 and SPEC ED 503. Required preparation must include completion of an introductory special education course, or SPEC ED 520; SPEC ED 504; or permission of instructor.

404 Professional Skills in Special Education 3

Course Prerequisite: SPEC ED 301 or 420. Legal aspects of special education, individualized education plans, roles and responsibilities of teachers, collaboration techniques, service delivery/design, and supervision of paraprofessionals. Credit not granted for both SPEC ED 404 and SPEC ED 504. Required preparation must include completion of an introductory special education course, SPEC ED 520.

409 Early Childhood Special Education 3

Course Prerequisite: SPEC ED 301 or 420. Assessment, curriculum, and instructional techniques for teaching young children with handicaps and their families in a variety of settings. Credit not granted for both SPEC ED 409 and SPEC ED 509. Required preparation must include completion of an introductory special education course, or SPEC ED 520.

420 Teaching in Inclusive Classrooms V 2-3

Course Prerequisite: For candidates admitted to teacher education (elementary education). Designed for preservice/inservice general education (K-12) teachers to learn how to teach students with disabilities. Credit not granted for both SPEC ED 420 and SPEC ED 520.

421 Inclusion Strategies for Special Education Teachers 3

Course Prerequisite: SPEC ED 301; SPEC ED 404. Roles and responsibilities of special education professionals in inclusion programs, including legal aspects and collaboration. Credit not granted for both SPEC ED 421 and SPEC ED 521. Required preparation must include completion of an introductory special education course, or SPEC ED 520; SPEC ED 504.

440 Methods in Intensive Educational Supports 3

Course Prerequisite: SPEC ED 301 or 420. Assessment, curriculum development and modification, and instructional methods for students with severe disabilities. Credit not granted for both SPEC ED 440 and SPEC ED 540. Required preparation must include completion of an introductory special education course, or SPEC ED 520.

470 Effective Assessment and Instruction in Reading for Diverse Learners 3

Course Prerequisite: SPEC ED 301 or 420. Preparation of K-12 teachers to conduct reading assessment and design reading interventions for students struggling in reading and literacy.

490 Practicum in Special Education V 1 (0-3) to 6 (0-18)

May be repeated for credit; cumulative maximum 9 hours. Course Prerequisite: SPEC ED 301 or SPEC ED 420; SPEC ED 404; for candidates admitted to teacher education (EDUC or SECED). Supervised field experience in special education. S, F grading.

499 Special Problems V 1-4

May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.

- 501 Teaching Students with Disabilities 3** Intervention and instructional strategies for managing academic, social, and behavior problems in classroom settings. Credit not granted for both SPEC ED 401 and SPEC ED 501. Required preparation must include completion of an introductory special education course, or SPEC ED 520.
- 502 Assessment and Curriculum for Students with Disabilities 3** Methods of individual and group, formal and informal assessment for students with disabilities. Credit not granted for both SPEC ED 402 and SPEC ED 502. Graduate level required preparation must include completion of an introductory special education course, or SPEC ED 520; SPEC ED 504; concurrent enrollment SPEC ED 590 (2 credits).
- 503 Secondary Education for Students with Disabilities 3** Overview of instruction and intervention strategies for secondary students with disabilities; assessment, and curriculum/program development. Credit not granted for both SPEC ED 403 and SPEC ED 503. Required preparation must include completion of an introductory special education course, or SPEC ED 520; SPEC ED 504; or permission of instructor.
- 504 Professional Skills in Special Education 3** Legal aspects of special education, individualized education plans, roles and responsibilities of teachers, collaboration techniques, service delivery/design, and supervision of paraprofessionals. Credit not granted for both SPEC ED 404 and SPEC ED 504. Required preparation must include completion of an introductory special education course, SPEC ED 520.
- 509 Early Childhood Special Education 3** Assessment, curriculum, and instructional techniques for teaching young children with handicaps and their families in a variety of settings. Credit not granted for both SPEC ED 409 and SPEC ED 509. Required preparation must include completion of an introductory special education course, or SPEC ED 520.
- 520 Teaching in Inclusive Classrooms V 2-3** Designed for preservice/inservice general education (K-12) teachers to learn how to teach students with disabilities. Credit not granted for both SPEC ED 420 and SPEC ED 520.
- 521 Inclusion Strategies for Special Education Teachers 3** Roles and responsibilities of special education professionals in inclusion programs, including legal aspects and collaboration. Credit not granted for both SPEC ED 421 and SPEC ED 521. Required preparation must include completion of an introductory special education course, or SPEC ED 520; SPEC ED 504.
- 522 Topics in Special Education V 1-4** May be repeated for credit; cumulative maximum 8 hours. Recent research developments, issues and/or applications in selected areas of special education.
- 540 Methods in Intensive Educational Supports 3** Assessment, curriculum development and modification, and instructional methods for students with severe disabilities. Credit not granted for both SPEC ED 440 and SPEC ED 540. Required preparation must include completion of an introductory special education course, or SPEC ED 520.
- 541 Foundations of Education of Children with Hearing Loss 2** Historical and contemporary forces impacting education of children with hearing loss with emphasis on technology.
- 542 Development of Language for Teachers of Children with Hearing Loss 3** Language from birth through school-age with emphasis on development and relationship of pragmatics, semantics and syntax.
- 543 Teaching Speech to Children with Hearing Loss 3** Strategies for assessing, developing and remediating the speech of children with hearing loss.
- 544 Developing Language in Children with Hearing Loss 3** Strategies for assessing and developing language in children with hearing loss.
- 545 Curriculum for Children with Hearing Loss 3** Strategies for modifying and adapting instruction in academic areas to meet the needs to students with hearing loss.
- 546 Working with Parents of Children with Hearing Loss 3** Impact of hearing loss on parents and strategies for helping parents cope at various stages of their child's life.
- 571 Prevention and Remediation of Reading Disabilities 3** Theoretical concepts, research, and strategies of reading assessment and instruction for students with disabilities. Required preparation must include completion of an introductory special education course, or SPEC ED 520; or permission of instructor.
- 589 Seminar in Disability Studies 3** Current research, issues, trends in disabilities within the broader context of education, society, history.
- 590 Practicum in Special Education V 1-4** May be repeated for credit; cumulative maximum 8 hours. Supervised experiences in application of theories and practices in special education. Required preparation must include completion of an introductory special education course, or SPEC ED 520; certified education major or completed certificate. S, F grading.
- 591 Response to Intervention Across the Core Academic Curriculum 3** New method of assessment for learning disability referred to as response to intervention. Recommended preparation: Admission to a doctoral program.
- 592 Single Subject Research Design and Methods 3** In-depth study of single subject research designs; critical analysis of strengths and weaknesses of each design. Recommended preparation: Admission to a doctoral program.
- 593 Diversity Issues in Special Education: Theory, Research and Practice 3** Diversity issues in special education examined and critically reflected upon for future use and practice. Recommended preparation: Admission to a doctoral program.
- 594 Prevention and Intervention for Emotional and Behavioral Disorders (EBD) 3** Cross-disciplinary perspectives on preventing mental, emotional, and behavioral disorders; analysis of evidence-based practices, research to practice gap, implementation and sustainability. Recommended preparation: Admission to a doctoral program.
- 595 Universal Design 3** Factors associated with developing, implementing and assessing curricular materials for individuals with disabilities. Recommended preparation: Admission to a doctoral program.
- 596 Seminar in Quality Indicators for Research in Special Education 1** May be repeated for credit; cumulative maximum 3 hours. Course Prerequisite: Doctoral standing. Examines quality indicators of research designs and approaches in special education.
- 600 Special Projects or Independent Study V 1-8** May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 800 Doctoral Research, Dissertation, and/or Examination V 1-18** May be repeated for credit. Course Prerequisite: Admitted to the Special Education PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

TEACHING AND LEARNING

TCH LRN

- 301 Learning and Development 3** Analysis of the connections among learning theories, human development theories, and educational practice in today's PK-12 classrooms.
- 304 Introduction to Middle Level Education 3** Course Prerequisite: HD 101; TCH LRN 301. Introduction to developmentally appropriate organization, structures, curriculum, and instruction in the middle grades.
- 305 Fundamentals of Instruction 2** Course Prerequisite: For candidates admitted to teacher education (elementary education). Introduction to lesson and unit plans, state standards, instructional models, and basic strategies for using and integrating technology.
- 306 [M] Survey of Elementary Reading and Language Arts 3** Course Prerequisite: For candidates admitted to teacher education (elementary education). Attitudes, knowledge, and skills needed for successful teaching of reading and language arts.

- 307 Survey of Children's Literature** 3 Types, values, selection of children's literature; role of teacher in facilitating children's experiences with books.
- 310 [M] Classroom Management** 2 Course Prerequisite: For candidates admitted to teacher education (elementary education). Strategies for developing positive and supportive classroom learning environments.
- 317 Initial Practicum Experience** 2 Course Prerequisite: TCH LRN 301. Classroom experience providing observation, reflection and gradual classroom involvement and teaching responsibility. S, F grading.
- 320 Elementary Reading Methods** 3 Course Prerequisite: For candidates admitted to teacher education (elementary education). Teaching methods, materials, and content in elementary school reading.
- 321 Early Literacy** 3 Course Prerequisite: For candidates admitted to teacher education (elementary education). Designed for pre-service teachers to link assessment and instruction and guide the development of early reading and writing skills.
- 322 [M] Reading and Writing in Grades 4 - 8** 3 Course Prerequisite: For candidates admitted to teacher education (elementary education). Designed for pre-service teachers to link assessment and instruction and assist upper-elementary students to read and write more effectively.
- 330 Diversity in Education** 3 Course Prerequisite: For candidates admitted to teacher education (Elementary Education); TCH LRN 301. Social, historical, and philosophical foundations of gender, socioeconomic, linguistic, and cultural diversity in schools.
- 333 Introduction to English as a Second Language (ESL)** 3 Foundations of ESL with attention to basic concepts of second language processing in educational settings.
- 339 Communicating in Diverse Classrooms** 3 Selected topics dealing with linguistic diversity, cross-cultural communication, language development and language use.
- 352 Teaching Elementary Mathematics** 3 Course Prerequisite: MATH 252; for candidates admitted to teacher education (EDUC). Teaching methods, materials, and content in elementary and middle school mathematics.
- 371 Teaching Elementary Science** 3 Course Prerequisite: For candidates admitted to teacher education (elementary education). Teaching methods, materials, and content in elementary and middle school science.
- 385 Teaching Elementary Social Studies** 3 Course Prerequisite: For candidates admitted to teacher education (elementary education). Teaching methods, materials, and content in elementary and middle school social studies.
- 390 Integrating Fine Arts into K-8 Curriculum** 3 Course Prerequisite: For candidates admitted to teacher education (elementary education). Integrating the range of fine arts (art, music, dance, drama) into K-8 curriculum; designed for preservice and inservice general K-8 teachers.
- 401 Practicum in Bilingual/ESL Education** 3 (2-3) May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: For candidates admitted to teacher education (elementary education or secondary education). Work with students from diverse cultural and linguistic backgrounds in an educational setting implementing theoretical foundations, skills, and strategies acquired from ESL coursework.
- 402 Instructional Practicum I** V 1 (0-3) to 6 (0-18) May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: For candidates admitted to teacher education (elementary education). Application of educational theories and approaches learned during methods Block I. S, F grading.
- 403 Social Foundations of Elementary Curriculum** 2 Course Prerequisite: For candidates admitted to teacher education (elementary education). The school; historical, and philosophical foundations of education; school law and professional certification.
- 404 Linguistics for Educators** 3 Use of linguistics to better understand second language learning and teaching and the physical aspects of acquiring a language. Recommended preparation: TCH LRN 333, and /or TCH LRN 339, or admission to the College of Education.
- 405 Instructional Practicum II** V 1 (0-3) to 6 (0-18) May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: For candidates admitted to teacher education (elementary education). Application of educational theories and approaches learned during methods Block II. S, F grading.
- 409 Fundamentals of Curriculum and Assessment for Teaching English Language Learners** 3 Research in curriculum development for and assessment of language minority students.
- 410 Theoretical Foundations of Bilingual/ESL Education** 3 Theoretical foundations related to research and instructional strategies for effective schooling of language minority students. Credit not granted for TCH LRN 410 and 510. Credit not granted for both TCH LRN 410 and TCH LRN 510.
- 411 Bilingual Methods and Materials Across Content Areas** 3 Course Prerequisite: TCH LRN 333, 335, 339, 410, or 413. Approaches, methods, and materials across content areas for the bilingual classroom.
- 413 Introduction to ESL for K-8 Teachers** V 2-3 Course Prerequisite: For candidates admitted to teacher education (elementary education). Introduction to teaching ESL students for K-8 teachers.
- 414 Methods and Materials for Bilingual/ESL Education** 3 Research and instructional methods related to English language acquisition across content areas. Credit not granted for both TCH LRN 414 and TCH LRN 514. Recommended preparation: Recommended: TCH LRN 410 or 510; TCH LRN 509; TCH LRN 549.
- 415 Student Teaching** V 6 (1-15) to 16 (1-40) Course Prerequisite: For candidates admitted to teacher education (elementary education or secondary education). To begin student teaching the candidate must have paid certification fees and have a currently valid teacher certificate application with character and fitness supplement on file; completed with a C or better all course work for the teacher certificate; received fingerprinting clearance from Washington State Patrol, FBI, and Office of Professional Practices; earned a 2.5 GPA overall, in endorsement area and professional core courses. Placement by interview only at approved sites. Supervised teaching in public schools including seminars reflecting on effective teaching and professional certification. S, F grading.
- 416 Computer-assisted Language Learning** 3 Course Prerequisite: TCH LRN 333. Principles of language learning with technology and application to problems of practice.
- 419 Instructional Media Production** 3 Course Prerequisite: TCH LRN 333. Principles of media design for diverse learners and application to problems of practice.
- 425 Conceptual Aspects of Mathematics** 3 Exploration of conceptual models for thinking about mathematical ideas; activities and discussions of mathematical thinking and instruction. (Crosslisted course offered as TCH LRN 425, MATH 425).
- 426 Middle Level Mathematics Methods** 3 Research-based and standards-aligned methods for teaching mathematics in the middle grades.
- 427 Proportional Reasoning** 3 Examination of work samples; identifying student's incomplete understanding of fundamental concepts; design instruction to develop a deeper understanding of rational numbers.
- 441 Psychology of Reading for K-12** 3 Enrollment not allowed if credit already earned for TCH LRN 551. Psychological, perceptual, motivational, developmental and physiological aspects of reading. Credit not allowed for students who have earned credit for TCH LRN 551.
- 445 Elementary Methods of Educational Technology** 2 (1-2) Course Prerequisite: For candidates admitted to teacher education (elementary education). Consideration of all technologies in K-8 schools, applications for their use, some production techniques and instructional methodologies.
- 448 Teaching Reading Comprehension** 3 Enrollment not allowed if credit already earned for TCH LRN 558. Key theoretical concepts and their implications for improved comprehension instruction, for K-12. Credit not allowed for students who have earned credit for TCH LRN 558.
- 463 Teaching Concepts of Probability and Statistics** 3 Course Prerequisite: MATH 252. Development of mathematical concepts and related teaching strategies for probability and statistics, with an emphasis on middle school topics. Credit not granted for both TCH LRN 463 and 563.

- 464 Curriculum, Instruction and Content Literacy Methods** 3 Development of curriculum, instruction and content literacy materials and methods for teaching in the secondary school classroom.
- 465 Teaching English Language Learners for Secondary Teachers** 3 Course Prerequisite: For candidates admitted to teacher education (secondary education). Practical knowledge for teaching ELL students in a variety of instructional contexts.
- 466 Secondary Methods of Educational Technology** 2 (1-2) Course Prerequisite: TCH LRN 317. Integration of technologies for teaching and learning within the 9-12 classrooms; hands-on development of technology enhanced activities and lessons.
- 467 [M] Adolescence, Community, and School** 3 Course Prerequisite: TCH LRN 464; TCH LRN 465; for candidates admitted to teacher education (secondary education). Understanding the socio-cultural dynamics of adolescence and youth cultures and the roles they play in secondary schools.
- 469 Advanced Practicum** 2 Course Prerequisite: TCH LRN 317. Field experience with classroom observation and teaching prior to student teaching; weekly seminar included. S, F grading.
- 470 Special Education, Transition, and Classroom Management for Secondary General Education Teachers** 3 Course Prerequisite: TCH LRN 464; TCH LRN 465; for candidates admitted to teacher education (secondary education). Overview of special education topics, transition practices, and classroom management techniques for general education classrooms.
- 480 Multicultural Education in a Global Society** 3 Multicultural and multilingual education from a global perspective; development of multicultural curriculum. Credit not granted for more than one of TCH LRN 480, 580, 582. Credit not granted for both TCH LRN 480 and TCH LRN 580.
- 483 Integrating Health and Fitness into K-8 Curriculum** 3 Course Prerequisite: For candidates admitted to teacher education (elementary education). Integrating health and fitness concepts into the K-8 curriculum; issues of abuse; designed for preservice and inservice K-8 teachers.
- 487 Global Geography** 3 Open to non-education majors. World geography as a global perspective; education in the contemporary world: the interaction between human societies and the natural environment.
- 490 [CAPS] Advanced Practicum** 3 (0-9) Course Prerequisite: TCH LRN 401 or 405; senior standing. Intensive practicum integrating educational theory with teaching in classroom contexts. S, F grading.
- 497 Topics in In-Service Education** V 1-3 May be repeated for credit; cumulative maximum 9 hours. New developments and applications on selected in-service and staff development topics.
- 499 Special Problems** V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. S, F grading.
- 501 Bilingual/ESL Education** 3 May be repeated for credit; cumulative maximum 6 hours. Work with students from diverse linguistic and cultural backgrounds in educational settings.
- 502 Assessment for Teaching and Learning** V 2-3 Instruction in sound assessment practices for preservice and inservice graduate students.
- 503 ESL Methods and Material for Secondary Content Teachers** 2 Research-based ESL strategies and methods for pre-service and secondary content area teachers.
- 504 Advanced Study in Linguistics for Educators** 3 Use of linguistics to better understand second language learning and teaching and the physical aspects of acquiring a language.
- 505 ESL Methods for General Educators (K-8)** 2 Course Prerequisite: For candidates admitted to MIT. Research-based ESL strategies and methods for pre-service and experienced teachers.
- 506 Multicultural Classroom Instruction and Management** 4 Instructional and management strategies for maximizing students' opportunities to learn in a multicultural setting.
- 507 Seminar in Literacy in Multicultural Settings I** 3 Multicultural perspective to curriculum development and classroom literacy practices.
- 508 Seminar in Literacy in Multicultural Settings II** 3 Course Prerequisite: TCH LRN 507. Multicultural perspective to curriculum development and classroom literacy practices.
- 509 Research in Curriculum and Assessment for Bilingual/ESL Education** 3 Research in curriculum development for and assessment of language minority students. Recommended preparation: TCH LRN 510; TCH LRN 549.
- 510 Theoretical Foundations of Bilingual/ESL Education** 3 Theoretical foundations related to research and instructional strategies for effective schooling of language minority students. Credit not granted for TCH LRN 410 and 510. Credit not granted for both TCH LRN 410 and TCH LRN 510.
- 511 Theoretical Foundations of Education Research** 3 Identification and use of theoretical components to guide and explain education research.
- 512 Language and Cultural Factors in Mathematics** 3 Research and instructional strategies related to linguistic and cultural influences on learning math.
- 513 Seminar in Middle School Education** 3 For experienced teachers. Curriculum patterns and recent research regarding instruction and materials in the contemporary middle school.
- 514 Methods and Materials for Bilingual/ESL Education** 3 Research and instructional methods related to English language acquisition across content areas. Credit not granted for both TCH LRN 414 and TCH LRN 514. Recommended preparation: Recommended: TCH LRN 410 or 510; TCH LRN 509; TCH LRN 549.
- 515 The Education of Cultural and Linguistic Minority Students** 3 Issues in the education of language minority students.
- 516 Advanced Study in Computer-Assisted Language Learning** 3 Research, theory, and practice in computer-assisted language learning.
- 517 Educational Technology in K-8 Schools** 2 (1-2) Course Prerequisite: For candidates admitted to MIT. Technology standards for teachers, technology use in schools, production techniques and instructional methods.
- 518 Integrating Technology into the Curriculum** 3 Examination and articulation of the potential for new technologies to expand learning opportunities.
- 519 Instructional Media Production I** 3 Instructional media development, emphasizing the theory and methods of instructional design, digital media production and evaluation.
- 520 Topics in Special Student Populations** V 1-4 May be repeated for credit; cumulative maximum 6 hours. For K-12 teachers. Knowledge of special student populations and guidance in developing appropriate curricula. Cooperative: Open to UI degree-seeking students.
- 521 Topics in Education** V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and/or applications in selected areas of education.
- 522 Topics in Education** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.
- 523 Topics in Education** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.
- 524 Topics in Education** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Recent research, development, issues, and/or applications in selected areas of education.
- 525 Classroom Management Seminar** V 2-3 Course Prerequisite: For candidates admitted to MIT. Contemporary issues in management of elementary, middle school, and secondary classrooms; issues of abuse.
- 526 Research in Multicultural Education** 3 Course Prerequisite: TCH LRN 515. Research and instructional practices focusing on multicultural education.

- 527 Seminar in Teacher Education Instruction** 1 May be repeated for credit; cumulative maximum 4 hours. Teacher preparation program components and rationale, university teaching strategies, and evaluation methods. S, F grading.
- 528 Literacy within the Disciplines** 3 Explores literacy research and practices that enhance the learning of various disciplines taught in K-12 settings.
- 529 Place-Based Education** 3 Theory and practice of place-based education with an emphasis on community-based action research and curriculum planning.
- 530 Innovations in Reading** V 2-3
- 531 Frameworks for Research in Mathematics and Science Education** 3 Exploration of research frameworks and methodologies specific to mathematics and science education.
- 532 Children's Literature in the Curriculum** 2 Theory and classroom applications for selecting and using literature and storytelling in content areas; reading, writing, language development, the arts.
- 533 Middle Level Mathematics Pedagogy and Philosophy** 3 Middle-school philosophy; understanding of effective standards and research-based instructional methods.
- 534 Conceptualization of Proportional Thinking** 3 Investigation of the development of K-14 students' understanding of proportional reasoning.
- 535 Gender, Power and Education** 3 Interdisciplinary focus on the relationships among gender, power and education.
- 536 Cultural Studies in Education** 3 Historical and conceptual background of the field of cultural studies.
- 537 Seminar in Language, Literacy, and Culture** 3 Interrelationships between schools, literacy, and student cultural background.
- 538 Writing Across the Curriculum** 3 Writing for learning at grade levels K-12.
- 539 Innovations in Language Arts** 3 The most recent developments in language arts instruction for pre-service and in-service teachers K-12.
- 540 Elementary School Social Studies** 3 Course Prerequisite: For candidates admitted to MIT. For candidates admitted to graduate teacher preparation and experienced teachers. Elementary structures of various social sciences; research findings related to instruction; classroom applications and materials.
- 541 Teacher Professional Certification: Pre-Assessment Seminar** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Candidates evaluate current teaching against standards to determine steps for professional growth plans which measure positive impact on student learning.
- 542 Teacher Professional Certification: Researching Exemplary Practices** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Teachers will apply exemplary practices, continue to assess their performance and college evidence of positive impact on student learning.
- 543 Teacher Professional Certification: Culminating Seminar** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Candidates will complete ProCert requirements to document positive impact on students' learning; set new goals; learn about National Board options.
- 544 Teaching Children's and Young Adult Literature** 3 Trends, issues, and research in children's and young adult literature.
- 546 Teaching Writing** 3 Theory and research relevant to instructional approaches and practices for teaching writing in K-12 schools.
- 547 Teaching Folk Literature to Children and Adolescents** 3 Folk literature as a genre in child and adolescent literature; curriculum applications; reading, language development, social studies, creative expression.
- 548 Teaching Adolescent Literature** 3 Evaluating, selecting, and using literature for middle school and teenage students.
- 549 Communicating in a Multilingual Society** 3 Study of language in social and educational context and its relation to cultural and linguistic diversity. Recommended preparation: TCH LRN 510.
- 550 Second Language Learning and Literacy** 3 Course Prerequisite: Admission to a graduate program. Research on second language teaching and learning in literacy education with a focus on English language learners in US schools.
- 551 Psychology of Reading** 3 Psychological, perceptual, motivational, developmental and physiological aspects of reading. Credit not allowed for students who have earned credit for TCH LRN 441.
- 552 Literacy Development I** 3 Course Prerequisite: For candidates admitted to MIT. For candidates admitted to graduate teacher preparation. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.
- 553 Assessment and Instruction for Reading** 4 (3-3) Evaluation techniques and instructional practices for impacting the reading achievement of K-12 students.
- 554 Sociolinguistics** 3 Interaction between language use and sociopolitical and cultural contexts; cultural and linguistic delivery and educational opportunity. Recommended preparation: TCH LRN 504.
- 555 Seminar in Literacy Development** 3 May be repeated for credit; cumulative maximum 6 hours. Current and historical research in reading/language arts, infancy through college and adult years; papers presented by faculty, invited speakers, and students.
- 556 Literacy Development II** 3 Course Prerequisite: For candidates admitted to MIT. Review of current research and approaches to instruction in the development of literacy in elementary and middle grades.
- 557 Research in Reading** 3 Exploration of qualitative and quantitative reading research covering topics of current and historical importance.
- 558 Improving Reading Comprehension (K-12)** 3 Enrollment not allowed if credit already earned for TCH LRN 448. Key theoretical concepts and their implications for improved comprehension instruction, for K-12. Credit not allowed for students who have earned credit for TCH LRN 448.
- 559 Readings in Cultural Studies and Social Thought in Education** 1 May be repeated for credit; cumulative maximum 3 hours. Current scholarship in the field of cultural studies in education and practices of schools.
- 560 Research in Teaching** 3 May be repeated for credit; cumulative maximum 6 hours. Recent developments in research on teaching; both quantitative and qualitative research methodologies emphasized.
- 561 Elementary School Mathematics** 3 Research on curriculum and instruction issues in elementary school mathematics.
- 562 Foundations of Literacy: Theory and Research** 3 Interdisciplinary inquiry into the various foundations of literacy.
- 563 Teaching Concepts of Probability and Statistics** 3 Development of mathematical concepts and related teaching strategies for probability and statistics, with an emphasis on middle school topics. Credit not granted for both TCH LRN 463 and 563.
- 564 Elementary School Mathematics Methods** 3 Course Prerequisite: For candidates admitted to MIT. Introduction to research, theory, and methods of teaching K-8 mathematics; emphasis on integrating theory and practice.
- 565 Introduction to Scholarly Inquiry** 1 Introduction to the Ed.M program including the scholarship and research requirements and the role of students and action research.
- 566 Democratic Education** 3 Rationale and skill to assist teachers in making classrooms more democratic.
- 567 Social Foundations of Language and Literacy** 3 Social and cultural theories of language and literacy. Recommended preparation: Admission to a doctoral program.
- 568 Psychological Foundations of Language and Literacy** 3 Psychological foundations of language and Literacy. Recommended preparation: Admission to a doctoral program.
- 569 Critical Analysis of Children's and Young Adult Literature** 3 Course Prerequisite: Admission to a graduate program. Multicultural analysis of children's and adolescent literature and its pedagogical and sociopolitical implications and possibilities.

- 570 Theory and Research in Electronic Literacies 3**. Ideas of literacy and effects of technology on literacy and policy, particularly those issues addressing diverse learners.
- 571 Elementary School Science 3** Theories and research underlying science programs with classroom implications.
- 572 Elementary School Science Methods 3** Course Prerequisite: For candidates admitted to MIT. Theoretical base to design and implement appropriate standards-based elementary science instruction.
- 573 Theory and Research in Computer-Assisted Language Learning 3** Information and tools needed to contribute to the CALL research literature.
- 574 Science for All: An Individual and Multicultural Perspective 3** Implications of cultural and individual diversity for understanding western scientific and mathematical thought; an activity-based, educational perspective.
- 575 Globalization and Identity in Education 3** Issues relating to the complexities of globalization and identity in education.
- 576 Youth Cultures in Education 3** Analysis of how youth cultures operate in society and how they are practiced in schools.
- 577 Curriculum Theory 3** Curriculum theory as the interdisciplinary study of educational experience.
- 578 National Board for Professional Teaching Standards (NBPTS) I 3** Development of evidence aligned with National Board standards and allowance for reflection on the impact of teaching and student learning. Required background must include: Bachelor's degree from accredited institution, valid state teaching/counseling certificate, completion of minimum 3 years successful full-time teaching in a U.S. P-12 school.
- 579 National Board for Professional Teaching Standards (NBPTS) II 3** Construct/submit portfolio of evidence meeting national standards in classrooms for National Board Certification assessment. Required background must include: Bachelor's degree from accredited institution, valid state teaching/counseling certificate, completion of minimum 3 years successful full-time teaching in a U.S. P-12 school.
- 580 Multicultural Education in a Global Society 3** Multicultural and multilingual education from a global perspective; development of multicultural curriculum. Credit not granted for more than one of TCH LRN 480, 580, 582. Credit not granted for both TCH LRN 480 and TCH LRN 580.
- 581 Learning and Development in Mathematics and Science 3** This course explores and illustrates what we know about various aspects of mathematical learning at various grade levels.
- 582 Scholarly Writing 3** Interdisciplinary; supports students to write publication-quality manuscripts.
- 583 Problem Solving in Elementary and Middle Level Education 3** Course Prerequisite: For candidates admitted to MIT. Integration of knowledge and skills to address complex cases in teaching and learning.
- 584 Research in Teaching Mathematics and Science 3** Development of an understanding for the research literature that is particularly related to mathematics and science teaching.
- 585 Focused Reading and Conference in Math/Science Education V 1-3** May be repeated for credit; cumulative maximum 9 hours. Designed to foster ongoing scholarship for individuals interested in mathematics and/or science educational research.
- 586 Seminar in Language, Literacy, and Technology 1** May be repeated for credit; cumulative maximum 3 hours. Tools for professional development in the areas of research, teaching, and service. Seminar compliments required courses in the LLT doctoral student program.
- 587 Environment, Culture and Education 3** Role of education in the social, ecological, and political conflicts between culture and environment.
- 588 Action Research: Teachers as Research 3** Theoretical concepts, research, issues, models, and strategies for implementation of action research.
- 589 Race, Identity and Representation in Education 3** Interdisciplinary research in race, identity and representations in education.
- 590 Internship V 2-6** May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: By interview only. Opportunities in professional positions. S, F grading.
- 591 Research Internship in Math/Science Education V 2-3** May be repeated for credit; cumulative maximum 6 hours. Provides opportunities for students to work closely with an accomplished researcher to observe, learn, and practice research methods.
- 592 Social Theory in Education 3** Social theory and how it applies to intellectual work in education. Recommended preparation: Admission to a doctoral program.
- 593 Pre-internship and Seminar 2 (1-3)** Course Prerequisite: For candidates admitted to MIT. Instructional practice in diverse classroom settings and reflection on that practice. S, F grading.
- 594 Integrating Fine Arts into K-8 Curriculum 2** Course Prerequisite: For candidates admitted to MIT. Integrating Fine Arts (art, music, dance, drama) into K-8 curriculum; designed for pre-service MIT.
- 595 Internship and Seminar 10 (1-27)** Course Prerequisite: TCH LRN 593. Instructional practice in classroom settings, reflection on practice; professional certification. S, F grading.
- 596 Topics in In-Service Education V 1-3** May be repeated for credit; cumulative maximum 12 hours. Advanced study of research, practice, and contemporary issues in education.
- 597 Topics in In-Service Education V 1-3** May be repeated for credit; cumulative maximum 9 hours. New developments and applications on selected in-service and staff development topics. S, F grading.
- 598 Research Seminar in Mathematics and Science Education 1** May be repeated for credit; cumulative maximum 6 hours. Through targeted readings and discussion, students will develop knowledge base proficiencies related to areas of mathematics/science education.
- 600 Special Projects or Independent Study V 1-18** May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, F grading.
- 700 Master's Research, Thesis, and/or Examination V 1-18** May be repeated for credit. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 702 Master's Special Problems, Directed Study, and/or Examination V 1-18** May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.
- 800 Doctoral Research, Dissertation, and/or Examination V 1-18** May be repeated for credit. Course Prerequisite: Admitted to one of the following PhD programs: Cultural Studies and Social Thought in Education, Math and Science Education, or Language, Literacy, and Technology. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Undergraduate Education

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Mary F. Wack, Vice Provost.

The Office of Undergraduate Education offers programs and courses that support all undergraduates at WSU. One- and two-credit courses are designed to fit student schedules and can be paired with other University courses or courses in the major for high-impact learning.

The curriculum assists students in gaining the skills for effective decision-making to manage key transitions of the college years: from high school or a community college to a research university, transition into a major, and transition from college into a career and a life of personal fulfillment.

Active and collaborative learning environments develop teamwork and leadership skills while also fostering positive relationships with a diverse community of peers, faculty, and advising staff. Students' progress in their degree programs is supported by these courses' focus on developing critical thinking, analytical, and information skills, as well as by their strong written and oral communications components. Frequent reflective assignments assist students in integrating their college experiences with their developing sense of personal and social responsibility and self-direction.

Certificates

Cougar Athletic Leadership Development Certificate

To earn the Cougar Athletic Leadership Development Certificate students complete a total of 15 credits and earn a 2.20 GPA or better in all coursework. Required courses: UNIV 295, 395, 399 and 495. Nine additional credits, including a minimum of three upper-division credits, are chosen in consultation with an advisor. Approved courses include: AMDT 440; COM 102, 105; COMSOC 301; ENGLISH 301; H D 205; MIL S 101, 102, 201, 202; PSYCH 321; TCH LRN 301; UNIV 100, 101, 301, 304, 491, and 497 (maximum 3 credits). No course may be taken pass, fail.

Global Leadership Certificate

Undergraduate Education offers the Global Leadership Certificate, in partnership with the Office of International Programs. The Global Leadership Certificate is structured around coursework and co-curricular experiences that empower students to analyze, adapt, communicate, problem-solve, and empathize in a variety of professional and personal networks. Taken together, the academic and co-curricular components build self-reliance, leadership and team skills in a global framework.

Requirements for the Global Leadership Certificate (4 sections, 15 credits total):

1) Four (4) Courses (12 credits): A minimum of four globally-related courses (twelve credits) may be applied to fulfill the academic coursework requirement for the Global Leadership Certificate. At least six credits must be taken at the 300-400 level. Approved courses include but are not limited to ANTH 203, 316, 418, COM 105, COMSOC 321, ECONS 101, ENVR S 101, FINE ART 202, I BUS 380, POL S 103, 418, 427, WOMEN ST 332; or as approved by advisor. Courses taken during an education abroad experience may also be applied, as well as up to four credit hours of foreign language at or above the 200 level.

2) Experiential Learning (1 credit; UNIV 490)

Students will fulfill the experiential requirement in one of two ways:

Intensive: An intensive experience is one in

which students are immersed in an international or domestic globally-related program or project for a specific period of time. These experiences include but are not limited to participation in education abroad, international or domestic academic research/internship/service learning, or an alternative spring break program. The intensive experience must be at least one week in duration and engage the student in a minimum of 45 hours.

Sustained: A sustained experience is one in which students participate "at home" over the course of one semester in globally-related service learning that engages them in a complex global issue such as poverty, hunger, health, economic development, or sustainability. Student may also fulfill the sustained experience through an approved globally-related internship or volunteer experience. Sustained experiences must be a minimum of 45 hours occurring within one semester.

3) Leadership in a Global Context (1 credit, UNIV 497): All students will complete the section of UNIV 497, Peer Leadership, specifically designed to fulfill requirements for the Global Leadership Certificate.

4) Integrative Capstone (1 credit, UNIV 491): Completion of the Integrative Capstone course enables the student to plan and design a project that advances their global leadership knowledge, experiences, and skills.

For additional information, contact the Director of Global Learning in the Office of International Programs.

Description of Courses

UNIVERSITY-WIDE

UNIV

100 College Majors and Career Exploration 1

Career development and the decision-making process; exploration of academic majors and careers. Credit not granted for UNIV 100 and 101.

101 College Majors and Career Choice 1

Course Prerequisite: By permission only. Career development and the decision-making process; exploration of academic majors and careers. Credit not granted for UNIV 100 and 101.

104 First-Year Success Seminar 2 Course

Prerequisite: Less than 30 credits. Strategies for college success, goal setting, integrative learning, and developing community connects in order to excel in the first year.

199 Introduction to Directed Research V

1-3 May be repeated for credit; cumulative maximum 12 hours. Introduction to independent research, scholarship, reading analysis, creative project, or field experiences.

250 Success in College and Beyond 1 Skills and

strategies that are critical for college success, professional development, and personal growth. S, F grading.

295 Introduction to Models of Leadership 2

Introduction to leadership theories; development of personal leadership skills and application of leadership strategies via experiential learning.

300 Accessing Information for Research 1

Effective research strategies in the disciplines, including emerging information resources, such as Internet.

301 College Major and Career Planning 1

Course Prerequisite: Sophomore standing. Assistance in developing effective major, career, and graduate school management approaches.

302 Advanced Writing Tutorial 1 (0-3) May

be repeated for credit; cumulative maximum 5 hours. Student-centered group tutorial on writing improvement in upper division courses. Enrollment in a Writing in the Major course or course that assigns writing is required. S, F grading.

303 Composing and Evaluation Strategies 1

Strategies of writing evaluation and composing strategies for writing-intensive courses. By instructor permission.

304 Seminar in Focused Exploration and Leadership 2 Course

Prerequisite: Sophomore standing. Seminar designed for students in transition to become better acclimated to the university environment and to aid in achieving academic and personal success.

395 Advanced Leadership 2 Course

Prerequisite: UNIV 295 or 497. Advanced study of theoretical and applied concepts of leadership through experiential learning, in-depth case analysis, and values exploration.

398 Internship V 2-15 May be repeated for credit;

cumulative maximum 15 hours. Cooperative educational internship with a business, government or non-profit organization. S, F grading.

399 Leadership Practicum 1 Course

Prerequisite: UNIV 395. Supervised practicum. S, F grading.

490 Global Leadership Experience 1 (0-3)

Course Prerequisite: Certified in Global Leadership Certificate program; by permission. Intensive or sustained experiential global learning through experiences such as education abroad or local intercultural activities. S, F grading.

491 Global Leadership Integrative Capstone

1 Course Prerequisite: Certified in Global Leadership certificate. Integrative culminating experience for global leadership.

492 Education Abroad Integrative Capstone

1 Course Prerequisite: By department permission. Integrative culminating experience for education abroad.

495 Leadership Capstone 1 Course

Prerequisite: UNIV 399. Culminating experience for Cougar Athletic Leadership Development certificate program.

496 Experiences in Health Care V 1-3 May be

repeated for credit; cumulative maximum 6 hours. Work or shadowing experience under supervision of a qualified professional in a clinic. S, F grading.

497 Peer Leadership V 1-4 May be repeated

for credit; cumulative maximum 9 hours. Development of leadership and interpersonal skills for specific peer leadership and paraprofessional positions.

College of Veterinary Medicine

www.vetmed.wsu.edu
Bustad 110
509-335-1531

The College of Veterinary Medicine offers courses of study leading to the degrees of Doctor of Veterinary Medicine, Master of Science in Veterinary Science, and Doctor of Philosophy. Additional information, including requirements for admission, is contained in the general information section of this catalog.

The College of Veterinary Medicine at Washington State University is accredited by the American Veterinary Medical Association.

DOCTOR OF VETERINARY MEDICINE PROGRAM REQUIREMENTS

A minimum of seven years is generally necessary to obtain the degree of Doctor of Veterinary Medicine (DVM). Most successful applicants have completed three to four years of undergraduate education. Following undergraduate studies, a student then takes four years of professional study directed by the College of Veterinary Medicine.

Applicants for admission to the College of Veterinary Medicine must present at least 64 semester credit hours of acceptable prerequisite credits from an accredited college or university. The 64 semester credit hours should include: 37 credit hours of science and math prerequisites, including general biology, inorganic and organic chemistry, biochemistry, physics, mathematics, genetics, and statistics; and 27 credit hours of University Common Requirements (UCORE): 21 credit hours of social science, arts and humanities, history, diversity studies, language, etc.; and 6 credit hours of English composition and communication (written or verbal). Nonacademic criteria for admission include clinical, animal and research experience, employment experience, honors and awards, extracurricular activities and community service, letters of recommendation, personal statement, and a personal interview.

Courses designed to fit the academic requirements are offered by Washington State University, and the number of students admitted to undergraduate courses is not limited. Since the number of applicants for admission to the DVM program exceeds the number that can be admitted, no assurance can be given that all applicants who successfully complete the undergraduate curriculum will be admitted. WSU does not grant a BS in pre-veterinary medicine. Students taking pre-veterinary course work may declare a major in any subject. Many successful applicants major in animal science, biology, chemistry, microbiology, neuroscience, wildlife ecology, zoology, or other science-related fields.

A major in veterinary medicine is not declared until admission to the College of Veterinary Medicine has been granted.

Information regarding the acceptability of course credits should be obtained from the Office of Student Services, College of Veterinary Medicine.

ADMISSION TO THE DVM PROGRAM

A student seeking to enter the professional DVM program should fill out both a Veterinary Medical College Application Service (VMCAS) application [http://www.aavmc.org/Students-Applicants-and-Advisors/Veterinary-](http://www.aavmc.org/Students-Applicants-and-Advisors/Veterinary-Medical-College-Application-Service.aspx)

[Medical-College-Application-Service.aspx](http://www.aavmc.org/Students-Applicants-and-Advisors/Veterinary-Medical-College-Application-Service.aspx)) and WSU College of Veterinary Medicine supplemental application (<http://dvm.vetmed.wsu.edu>). Please see <http://dvm.vetmed.wsu.edu> for further application information. The Admissions Committee, with the approval of the Board of Regents, selects those students to be admitted to the first year of the professional DVM program. Applicants will be notified of their acceptance on or before April 15th. Unsuccessful applicants who wish to be considered the next year must present new applications.

In accordance with policies adopted by the Board of Regents, preference for admission to the College of Veterinary Medicine is as follows:

- To qualified residents of Washington, Idaho, Montana, or Utah.
- To qualified applicants certified and financed by the Western Interstate Commission for Higher Education (WICHE) Compact states.
- To all other qualified students.

HONORS PROGRAM FOR SELECTED STUDENTS

A special program for admission of highly selected and academically qualified students to the Washington State University College of Veterinary Medicine has been established with the WSU Honors College. This program admits students directly to the college upon completion of one year of undergraduate work at WSU. This is a pre-admit program leading to the Doctor of Veterinary Medicine degree after satisfactory completion of a designed curriculum. It consists of three years of a unique undergraduate pre-professional education and the four-year professional DVM program. The first three years of this program are a combination of Honors College courses and regular University classes which fulfill the pre-veterinary requirements plus the completion of an honors thesis. The last four years are the traditional Doctor of Veterinary Medicine program. Applicants should identify themselves to the Honors College as soon as students decide to enter WSU, because the number of positions is limited.

Combined Program in Animal Sciences and Veterinary Medicine - See Department of Animal Sciences.

Schedules of Studies

Honors students complete the Honors College requirements which replace the UCORE requirements.

DVM PROFESSIONAL CURRICULUM (153 HOURS)

The professional curriculum for the Doctor of Veterinary Medicine degree is outlined below. A total of 154 semester hours are required for graduation. All courses required in the professional program are 500-600-level professional courses.

Fourth Year: The fourth year begins immediately after the end of the spring semester of the third year (May) and continues for 12 consecutive months. Fourth-year professional students are required to enroll in course work for a minimum of 44 credits in their final year. All students must participate in mandatory clinical rotations in the large- and small-animal clinics, including emergency services and

anesthesia. In addition, each student must select elective opportunities in their area of interest. All students must prepare and present a senior paper under faculty supervision.

First Year

<i>First Term</i>	<i>Hours</i>
VET MED 510	4
VET MED 511	5
VET MED 513	4
VET MED 568	2
VET MED 586	1

<i>Second Term</i>	<i>Hours</i>
VET MED 512	4
VET MED 520	5
VET MED 521	3
VET MED 534	3
VET MED 545	3
VET MED 580	1

Second Year

<i>First Term</i>	<i>Hours</i>
VET MED 522	3
VET MED 535	3
VET MED 536	4
VET MED 546	6
VET MED 589	3

<i>Second Term</i>	<i>Hours</i>
VET MED 523	3
VET MED 537	4
VET MED 543	2
VET MED 561	2
VET MED 576	1
VET MED 585	2
VET MED 587	2
VET MED 588	3

Third Year

<i>First Term</i>	<i>Hours</i>
VET MED 502	1
VET MED 524	3
VET MED 551	5
VET MED 553	3
VET MED 554	1
VET MED 569	4
VET MED 578	3

<i>Second Term</i>	<i>Hours</i>
VET MED 500	1
VET MED 552	3
VET MED 570	3
VET MED 571	3
VET MED 572	2
VET MED 575	1
VET MED 590	1
VET MED 596	1
VET MED 598	1

Fourth Year

<i>First Term</i>	<i>Hours</i>
Equine Elective ¹	2
Medicine Elective ²	4
Supplemental Electives ³	14
Surgery Elective ⁴	2
VET MED 600	1
VET MED 605	2
VET MED 606	2
VET MED 607	2

<i>Second Term</i>	<i>Hours</i>
VET MED 650	3
VET MED 656	2
VET MED 674	1
VET MED 675	2
VET MED 690	2
VET MED 691	4
VET MED 699	1

¹ Select one from VET MED 628 or 629.

² Select two from VET MED 609, 620, or 621.

³ Courses to be chosen in consultation with advisor. Approved courses include 600-level VET MED courses. Courses may not be used to fulfill more than one requirement unless they are repeated for additional credit.

⁴ VET MED 608, or advisor-approved 698 course.

Description of Courses

VETERINARY MEDICINE

VET MED

350 Skeletal Preparation 1 May be repeated for credit; cumulative maximum 3 hours. Course Prerequisite: Second year Veterinary Medicine students. Technique of skeletal preparation is mastered by undertaking and completing project. Skeleton becomes property of student. S, M, F grading.

499 Special problems V 1-4 May be repeated for credit. Course Prerequisite: Veterinary Medicine student. Special problems V 1 (0-3) to 4 (0-12) Course Prerequisite: Veterinary medicine student. S, M, F grading.

500 Animals, Society, and the Veterinarian 1 Active participation in activities designed to enhance personal growth, character development and leadership skills. S, M, F grading.

501 International Veterinary Medicine 1 Course Prerequisite: Veterinary Medicine student. Important issues and constraints facing the global community. S, M, F grading.

502 Communication Skills V 1-3 Course Prerequisite: Veterinary Medicine student. Exercises designed to enhance communication and relational skills. S, M, F grading.

504 Global Studies V 1 (0-3) to 6 (0-18) Course Prerequisite: VET MED 501. Preceptorship in the US or overseas, under direct supervision of veterinarian, agriculture or public health professional; related to international veterinary medicine. S, M, F grading.

505 Reverence for Life 1 (0-2) Course Prerequisite: Veterinary Medicine student. Connections between humans and animals; discussions related to use of animals in Western societies; social issues related to veterinary medicine. S, M, F grading.

508 Research Orientation and Resource 1 Course Prerequisite: Veterinary Medicine student. Resources and important issues for identifying and developing a focused area of scholarly activity in biomedical research. S, M, F grading.

509 Research Issues, Ethics, and Literacy 1 May be repeated for credit; cumulative maximum 3 hours. Course Prerequisite: Veterinary Medicine student. Philosophy and history of methodological, ethical and political issues relevant to biomedical research using selected monographs and essays. May be repeated for credit; cumulative maximum 3 hours. S, M, F grading.

510 Veterinary Microscopic Anatomy 4 (3-3) Course Prerequisite: Veterinary Medicine student. Microscopic functional morphology of the cell, tissues, and selected organ systems of domestic animals. S, M, F grading.

511 Veterinary Anatomy I 5 (0-15) Course Prerequisite: Veterinary Medicine student. Detailed macroscopic functional morphology of the dog with comparison to other domestic animals; developmental anatomy of selected organ systems. S, M, F grading.

512 Veterinary Anatomy II 4 (1-9) Course Prerequisite: VET MED 511. Detailed macroscopic functional morphology of domestic animals. S, M, F grading.

513 Veterinary Cell Physiology 4 Course Prerequisite: Veterinary Medicine student. Cell physiology focusing on endocrine, paracrine, and neurotransmission signaling processes, transcriptional and translational control, and methodologies relevant to medicine. S, M, F grading.

517 Small Animal Applied Anatomy and Surgical Techniques 2 (1-3) Course Prerequisite: VET MED 512. Applied anatomy of small animals including surgical anatomy. S, M, F grading.

518 Large Animal Applied Anatomy and Surgical Techniques 2 (1-3) Course Prerequisite: VET MED 512. Applied anatomy of large animals including surgical anatomy. S, M, F grading.

520 Veterinary Physiology 5 (4-3) Course Prerequisite: VET MED 510. Physiology of domestic animals. Cooperative: Open to UI degree-seeking students. S, M, F grading.

521 Introduction to Veterinary Neurology 3 (2-3) Course Prerequisite: VET MED 510. Neuroanatomical and neurophysiological bases of veterinary neurology, emphasizing central and peripheral sensory and motor systems. S, M, F grading.

522 Fundamentals of Pharmacology 3 Course Prerequisite: Veterinary Medicine student. Fundamentals of pharmacology, including pharmacokinetics (absorption, distribution, metabolism, excretion), receptor theory and general mechanisms of drug action. S, M, F grading.

523 Veterinary Toxicology 3 Course Prerequisite: VET MED 522. Pharmacology and toxicology of the systems of domestic animals. Continuation of VET MED 522P. S, M, F grading.

524 Clinical Veterinary Pharmacology 3 Course Prerequisite: VET MED 523. Clinical pharmacology of domestic animal species. S, M, F grading.

525 Animal Behavior for the Practicing Veterinarian 1 (0-3) May be repeated for credit; cumulative maximum 2 hours. Course Prerequisite: Veterinary Medicine student. Study of the treatment of behavioral problems and training of domestic animals. S, M, F grading.

526 Domestic and Exotic Animal Behavior 2 (1-3) Course Prerequisite: Veterinary Medicine student. Focus on the medical relevance of behaviors that can cause diseases, and diseases that can lead to behavior problems in domestic and exotic animals. (Crosslisted course offered as VET MED 526, NEUROSCI 526). Cooperative: Open to UI degree-seeking students. S, M, F grading.

534 Veterinary Immunology 3 (2-3) Course Prerequisite: Veterinary Medicine student. Immunology for the professional veterinary student. S, M, F grading.

535 Veterinary Virology 3 Course Prerequisite: Veterinary Medicine student. Virology for the professional veterinary student. S, M, F grading.

536 Veterinary Bacteriology 4 (3-3) Course Prerequisite: Veterinary Medicine student. Bacteria that produce disease in animals. S, M, F grading.

537 Veterinary Parasitology 4 (3-3) Course Prerequisite: Veterinary Medicine student. Arthropods, protozoa, and helminths of veterinary importance; their host-parasite relationship and control. S, M, F grading.

542 Diseases of Wildlife 2 Course Prerequisite: Veterinary Medicine student. Management principles, epidemiology, pathology, treatment, and control of diseases in wild birds, fish, and mammals. S, M, F grading.

543 Veterinary Medicine and Human Health 2 Course Prerequisite: Veterinary Medicine student. Preparation for veterinary students in public health and food hygiene. S, M, F grading.

545 General Pathology 3 (2-3) Structural and functional alterations in disease; elementary oncology. Cooperative: Open to UI degree-seeking students. S, M, F grading.

546 Systemic Pathology 6 (5-3) Course Prerequisite: VET MED 545. Principles of system and organ response to injury, and the effects of injury/disease on the animal host. S, M, F grading.

551 Small Animal Medicine I 5 Course Prerequisite: Veterinary Medicine student. Diagnosis and treatment of small animal diseases. S, M, F grading.

552 Small Animal Medicine II 3 Course Prerequisite: VET MED 551. Diagnosis and treatment of small animal diseases. Continuation of VET MED 551P. S, M, F grading.

553 Small Animal Surgery 3 Course Prerequisite: Veterinary Medicine student. Principles of surgical techniques and small animal surgery. S, M, F grading.

- 554 Small Animal Anesthesia and Surgery** 1 (0-3) Course Prerequisite: VET MED 586; VET MED 587; concurrent enrollment in VET MED 553. Work professionally as a team to anesthetize, spay, and provide peri-operative care for surgical patients. S, M, F grading.
- 555 Small Animal Clinical Problem Solving** 2 Case-based investigation of small animal clinical presentations, diagnosis, and treatment plans. S, M, F grading.
- 556 Small Animal Soft Tissue Surgery Elective** 1 (0-3) Course Prerequisite: VET MED 553. Instruction of advanced surgical techniques, primarily involving canine and feline soft tissue. S, M, F grading.
- 557 Small Animal Surgery Elective II** 1 (0-3) Course Prerequisite: VET MED 553. Small animal orthopedic surgical exercises. S, M, F grading.
- 558 Diseases and Management of Pet and Wild Birds** 2 (1-3) Course Prerequisite: Veterinary Medicine student. Management and handling, diagnosis and treatment of various disease conditions of pet and wild birds. S, M, F grading.
- 559 Special Animal Medicine** V 1-3 Course Prerequisite: Veterinary Medicine student. Handling, restraint, care, normative features, procedures and diseases of unusual animals as pets or those used in food production or research. S, M, F grading.
- 561 Clinical Specialties** V 1-4 Course Prerequisite: Veterinary Medicine student. This course includes clinical disciplines that are not considered core internal medicine, such as ophthalmology and dermatology. S, M, F grading.
- 562 Complementary and Alternative Veterinary Medicine** 1 Presentation of complementary and alternative veterinary medicine theories and techniques. S, M, F grading.
- 566 Population Theriogenology - Food Animal** 3 Course Prerequisite: Veterinary Medicine student. Population theriogenology in food animal or mixed animal practice. S, M, F grading.
- 567 Applied Comparative Reproductive Physiology** 1 Course Prerequisite: Veterinary Medicine student. Applied comparative reproduction physiology of domestic animals. S, M, F grading.
- 568 Animal Handling and Orientation** 2 (1-3) Course Prerequisite: Veterinary Medicine student. Introduction to clinical restraint procedures, physical exam and treatment procedures, and clinical behavior and management. S, M, F grading.
- 569 Agricultural Animal Medicine I** 4 (3-3) Course Prerequisite: Veterinary Medicine student. Infectious and non-infectious conditions of agricultural animals. S, M, F grading.
- 570 Agricultural Animal Medicine II** 3 Course Prerequisite: VET MED 569. Infectious and non-infectious conditions of agricultural animals; introduction to performance medicine. Continuation of VET MED 569P. S, M, F grading.
- 571 Theriogenology** 3 Course Prerequisite: Veterinary Medicine student. Diagnosis, symptomatology, and treatment of reproductive disorders. S, M, F grading.
- 572 Large Animal Surgery** 2 Course Prerequisite: VET MED 553; veterinary medicine student. Large animal surgical techniques. S, M, F grading.
- 573 Surgery Laboratory III** 1 Course Prerequisite: VET MED 512; concurrent enrollment in VET MED 572. Surgical exercises using large animals. S, M, F grading.
- 574 Equine Lameness** 2 Principles of diagnosis and treatment of musculoskeletal disorders of the horse. S, M, F grading.
- 575 Clinical Techniques in Theriogenology** 1 (0-3) Course Prerequisite: Concurrent enrollment in VET MED 571. Canine, bovine, equine, bull breeding, stallion breeding, and obstetrics. S, M, F grading.
- 576 Emerging and Exotic Diseases of Animals** 1 Course Prerequisite: Veterinary Medicine student. To increase understanding of emerging and exotic diseases of animals among veterinary students. S, M, F grading.
- 577 Herd Production Medicine** 2 Course Prerequisite: Veterinary Medicine student. Fundamentals of developing and providing business-to-business (B2B) professional services to commercial scale livestock operations. S, M, F grading.
- 578 Veterinary Equine Medicine** 3 Course Prerequisite: Veterinary Medicine student. Discussion of clinical presentation, diagnosis and treatment of common medical diseases of horses. S, M, F grading.
- 579 Advanced Equine Medicine** 2 Course Prerequisite: VET MED 578. Advanced topics in pathophysiology, clinical signs, diagnosis, treatment and prognosis of common medical problems of the horse. S, M, F grading.
- 580 Basic Nutrition** 1 Course Prerequisite: Veterinary Medicine student. Introduction to the concepts of basic nutrition designed for the first year veterinary student. S, M, F grading.
- 581 Agricultural Animal Problems Seminar** 1 May be repeated for credit; cumulative maximum 6 hours. Investigation of current herd problems and evaluation of emerging animal agricultural issues. S, M, F grading.
- 582 Agricultural Animal On-Farm Clinical Experience** 1 May be repeated for credit; cumulative maximum 3 hours. On-farm investigation of individual and herd problems and on-farm provision of professional service. S, M, F grading.
- 585 Epidemiology** 2 Course Prerequisite: Veterinary Medicine student. Minimally quantitative survey in which health is framed as a population phenomena. S, M, F grading.
- 586 Principles of Surgery** 1 Course Prerequisite: Veterinary Medicine student. Principles of surgery for the professional veterinary student. S, M, F grading.
- 587 Clinical Anesthesiology** 2 (1-3) Course Prerequisite: Veterinary Medicine student. Clinical anesthesiology for the professional veterinary student. S, M, F grading.
- 588 Radiology** 3 (2-3) Course Prerequisite: Veterinary Medicine student. Introduction to radiography and diagnostic radiology. S, M, F grading.
- 589 Clinical Pathology** 3 (2-3) Course Prerequisite: Veterinary Medicine student. Laboratory diagnostic procedures and interpretation. S, M, F grading.
- 590 Veterinary Clinical Nutrition** V 1-3 May be repeated for credit; cumulative maximum 3 hours. Large and small animal clinical nutrition; nutrient composition; nutritional diseases and practical feeding methods. S, M, F grading.
- 591 Practice Management** 2 Course Prerequisite: Veterinary Medicine student. A correlation of the veterinary medical and business aspects of practice management. S, M, F grading.
- 592 Small Animal Transfusion Therapy** 1 (0-3) Course Prerequisite: VET MED 589. Blood collection, storage, pretransfusion testing, component therapy and transfusion reactions. S, M, F grading.
- 593 Pain and Analgesics** 2 Course Prerequisite: VET MED 587. Supplemental core course for DVM students; anatomy and physiology of pain; recognition and treatment of pain in veterinary patients. S, M, F grading.
- 595 Internship in Veterinary Medicine** V 1-3 Work experience related to academic learning; under supervision of veterinary professionals and/or faculty. S, M, F grading.
- 596 Special Topics** V 1-4 May be repeated for credit; cumulative maximum 15 hours. Course Prerequisite: Veterinary Medicine student. Professional leadership skill development for veterinarians. S, M, F grading.
- 597 Special Topics** V 1-4 May be repeated for credit; cumulative maximum 15 hours. Course Prerequisite: Veterinary Medicine student. Special topics in veterinary medicine. S, M, F grading.
- 598 Introduction to Clinics** 1 (0-3) Course Prerequisite: Veterinary Medicine student. Introduction to the practice of clinical veterinary medicine and surgery within the Veterinary Teaching Hospital including records, presentation and protocol. S, M, F grading.
- 599 Special Problems** V 1 (0-3) to 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: Veterinary Medicine student. S, M, F grading.
- 600 Scientific Writing and Presentation** 1 Course Prerequisite: Veterinary Medicine student. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. S, M, F grading.

- 603 Clinical Elective at Oregon State University** V 1-4 May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: Veterinary Medicine student. Clinical medicine training in diseases of food animals and horses; clinic rounds and diagnostic procedures. S, M, F grading.
- 605 Small Animal Community Practice Medicine** V 1 (0-3) to 4 (0-12) Course Prerequisite: Veterinary Medicine student. Required clinical experience with the small animal community practice service in the small animal clinic of the Veterinary Medicine Hospital. S, M, F grading.
- 606 Small Animal Referral Medicine** V 1 (0-3) to 4 (0-12) Course Prerequisite: Veterinary Medicine student. Required clinical experience with the small animal referral medicine service in the small animal clinic of the Veterinary Medicine Hospital. S, M, F grading.
- 607 Small Animal Soft Tissue Surgery** V 1 (0-3) to 4 (0-12) Course Prerequisite: Veterinary Medicine student. Required clinical experience with the soft tissue surgery service in the small animal clinic of the Veterinary Medicine Hospital. S, M, F grading.
- 608 Small Animal Orthopedic Surgery** V 1 (0-3) to 14 (0-42) Course Prerequisite: Veterinary Medicine student. Required clinical experience with the small animal orthopedic surgery service in the small animal clinic of the Veterinary Medicine Hospital. S, M, F grading.
- 609 Small Animal Clinical Neurology** V 1 (0-3) to 4 (0-12) Course Prerequisite: Veterinary Medicine student. Required clinical experience with the small animal neurology service in the small animal clinic of the Veterinary Medicine Hospital. S, M, F grading.
- 611 Small Animal Orthopedic Surgery Elective** V 1-4 May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: Veterinary Medicine student. Elective clinical experience with the Small Animal Orthopedic Surgery Service in the Small Animal Clinic, Veterinary Teaching Hospital. S, M, F grading.
- 612 Small Animal Soft Tissue Surgery Elective** V 1-4 May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: Veterinary Medicine student. Elective clinical experience with the Small Animal Soft Tissue Surgery Service in the Small Animal Clinic of the Veterinary Teaching Hospital. S, M, F grading.
- 613 Small Animal Referral Medicine Elective** V 1-4 May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: Veterinary Medicine student. Elective clinical experience with the Small Animal Medicine Referral Practice Service in the Small Animal Clinic of the Veterinary Teaching Hospital. S, M, F grading.
- 614 Small Animal Community Practice Elective** V 1-4 May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: Veterinary Medicine student. Elective clinical experience with the Small Animal Medicine Local Practice Service in the Small Animal Clinic, Veterinary Teaching Hospital. S, M, F grading.
- 615 Small Animal Medicine - Special Topics** V 1-4 May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: Veterinary Medicine student. Elective clinical experience in a specialty practice area of small animal clinical medicine or surgery. S, M, F grading.
- 616 Exotic Animal Medicine** V 1-4 May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: Veterinary Medicine student. Elective clinical experience with the Small Animal Medicine Exotic Practice Service in the Small Animal Clinic, Veterinary Teaching Hospital. S, M, F grading.
- 617 Small Animal Clinical Neurology Elective** V 1-3 Course Prerequisite: Veterinary Medicine student. Rotation will emphasize neuroanatomical localization, differential diagnosis, diagnostic testing, and treatments. S, M, F grading.
- 620 Clinical Oncology** V 1 (0-3) to 4 (0-12) May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: Veterinary Medicine student. Diagnosing, staging and treating the veterinary cancer patient. S, M, F grading.
- 621 Clinical Cardiology** V 1 (0-3) to 4 (0-12) May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: Veterinary Medicine student. Basics in physical assessment, diagnosis and treatment of common cardiac disorders. S, M, F grading.
- 628 Equine Surgery Clinical Rotation** V 2-6 Course Prerequisite: Veterinary Medicine student. Required rotation through the Equine Surgery Services of the Veterinary Teaching Hospital. S, M, F grading.
- 629 Equine Medicine Clinical Rotation** V 2-6 Course Prerequisite: Veterinary Medicine student. Required rotation through the Equine Medicine Services of the Veterinary Teaching Hospital. S, M, F grading.
- 630 Agricultural Animal Clinical Rotation** V 2-6 Course Prerequisite: Veterinary Medicine student. Elective rotation for Agricultural Animal Medical, Surgical, and Ambulatory Service of the Veterinary Teaching Hospital. S, M, F grading.
- 631 Population Medicine** V 1 (0-3) to 4 (0-12) Course Prerequisite: Veterinary Medicine student. Required rotation for agricultural animal species emphasis through the population medicine laboratory of the Veterinary Teaching Hospital. S, M, F grading.
- 632 Large Animal Theriogenology - Special Topics** V 1-4 May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: Veterinary Medicine student. Elective clinical theriogenology subjects in large animals. S, M, F grading.
- 633 Agricultural Animal Special Topics** V 1-4 May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: Veterinary Medicine student. Elective clinical subjects in food animal diseases and herd health/preventive medicine. S, M, F grading.
- 635 Preventive Medicine at Canine Center** V 1-4 May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: Veterinary Medicine student. Preventive medicine and management practices related to control of animal diseases at Canine Center, UI, Caldwell Idaho. S, M, F grading.
- 636 Equine Medicine Elective** V 1-4 May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: Veterinary Medicine student. Elective clinical experience with the Equine Medicine Service in the Large Animal Clinic of the Veterinary Teaching Hospital. S, M, F grading.
- 637 Equine Surgery Elective** V 1-4 May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: Veterinary Medicine student. Elective clinical experience with the Equine Surgery Service in the Large Animal Clinic, Veterinary Teaching Hospital. S, M, F grading.
- 638 Equine Track** V 1-4 Course Prerequisite: Veterinary Medicine student. Clinical experience with the Equine Surgery Service of the Large Animal Clinic, Veterinary Teaching Hospital. S, M, F grading.
- 650 Anesthesia Case Management** V 1-4 Course Prerequisite: Veterinary Medicine student. Required rotation through the Clinical Anesthesia Service of the Small Animal Clinic and Large Animal Clinic of the Veterinary Teaching Hospital. S, M, F grading.
- 651 Pharmacy and Therapeutics** 1 Course Prerequisite: Veterinary Medicine student. One-week overview of Washington and federal drug laws, inventory control, formulary management, therapeutics for a successful practice. S, M, F grading.
- 652 Technical and Diagnostic Radiology** V 1-4 May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: Veterinary Medicine student. Laboratory exercises and instructional sessions to increase proficiency in clinical diagnostic radiology. S, M, F grading.
- 653 Imaging Services Elective** V 1 (0-3) to 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: Veterinary Medicine student. Elective clinical and laboratory experience with the Radiology Section in the Small Animal Clinic, Veterinary Teaching Hospital. S, M, F grading.
- 656 Diagnostics** V 1-4 Course Prerequisite: Veterinary Medicine student. Advanced study in diagnostic pathology, toxicology, and microbiology. S, M, F grading.
- 657 Clinical Pathology** V 1-4 May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: Veterinary Medicine student. Clinical laboratory diagnosis and interpretation. S, M, F grading.

- 673 Small Animal Critical Care** V 1 (0-3) to 4 (0-12) May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: Veterinary Medicine student. Elective clinical experience, didactic topic discussions, and instructional sessions in small animal critical care. S, M, F grading.
- 674 Small Animal Intensive Care** V 1 (0-3) to 4 (0-12) Course Prerequisite: Veterinary Medicine student. Required rotation for all students through the small animal intensive care unit. S, M, F grading.
- 675 Emergency and Critical Care** V 1-4 Course Prerequisite: Veterinary Medicine student. Required rotation for all students through the large animal emergency and critical care unit. S, M, F grading.
- 676 Veterinary Research Practicum** V 1-8 May be repeated for credit; cumulative maximum 14 hours. Course Prerequisite: Veterinary Medicine student. Individualized research project. S, M, F grading.
- 690 Externship** V 1-4 May be repeated for credit; cumulative maximum 4 hours. Course Prerequisite: Veterinary Medicine student. Theory of practice of veterinary medicine in a non-university situation. S, M, F grading.
- 691 Guided Preceptorship** V 1-4 Course Prerequisite: Veterinary Medicine student. Guided preceptorship in an accepted extramural clinical or laboratory setting. S, M, F grading.
- 692 Government, Corporate, and Zoological Practice Elective** V 1-6 May be repeated for credit; cumulative maximum 10 hours. Course Prerequisite: Veterinary Medicine student. Elective experience in government, corporate, and zoological veterinary medicine arranged through nationwide matching program. S, M, F grading.
- 693 Laboratory Animal Medicine** V 1-4 May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: Veterinary Medicine student. Elective clinical and laboratory experience with major research facilities such as the Department of Comparative Medicine, University of Washington. S, M, F grading.
- 694 Avian Medicine** V 1-4 Course Prerequisite: Veterinary Medicine student. Laboratory diagnosis and pathology of avian (pet bird and commercial fowl) diseases. S, M, F grading.
- 698 Special Topics** V 1-4 May be repeated for credit; cumulative maximum 15 hours. Course Prerequisite: Veterinary Medicine student. Special clinical topics or opportunities in veterinary medicine. S, M, F grading.
- 699 Advanced Clinical Special Topics** V 1-4 May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: Veterinary Medicine student. Advanced clinical subjects developed as courses for fourth year veterinary students. S, M, F grading.

Department of Veterinary Clinical Sciences

www.vetmed.wsu.edu/depts-vcs/
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The PhD and MS programs in Veterinary Clinical Sciences provide education and training in biomedical science with an emphasis on Veterinary Medicine and applications to clinical medicine. The research environment includes faculty with both clinical and basic research interests and provides a unique environment for application of fundamental biomedical principles to solving important clinical problems. The Clinical Sciences graduate group offers MS and PhD programs focused on training scientists to have broad expertise in appropriate concepts, theories, and emerging methods to effectively conduct research across the disciplines represented in Veterinary Clinical Sciences. To fully understand "health" and appropriate interventions at population and individual levels through studies ranging from the molecular (genetics, pharmacogenetics, molecular epidemiology, bacterial genome characterization), cellular (mechanisms of tumor cell resistances), systems (orthopedics, theriogenology), mechanism of disease (oncology, neurology), populations (epidemiology, gene flow within populations, disease rates), and evaluation of disease interventions (clinical trials, observational studies). The MS program may also be paired with advanced clinical training where the student participates in post-DVM clinical training with the goal of specialty board certification enhanced by training in clinical research methods.

Description of Courses

VETERINARY CLINICAL MEDICINE AND SURGERY

VET CLIN

- 361 Agricultural Animal Health** 3 Course Prerequisite: One ANIM SCI or BIOLOGY course. Introduction to basic concepts of infectious, noninfectious, and parasitic diseases of animals of agricultural and public health importance.

- 367 Medical and Surgical Problems in the Horse** 3 Basic health care of horses with respect to good health care and recognizing and responding to disease and injury situations.

- 498 Nihon University Seminar** 2 (1-3) Course Prerequisite: By permission only; fourth or fifth year veterinary DVM students from Nihon University. Lectures and laboratory sessions in small animal, exotic animal, and equine veterinary medicine and surgery. S, F grading.

- 499 Special Problems** V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. Cooperative: Open to UI degree-seeking students. S, F grading.

- 565 Oncology Journal Seminar** 1 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Admission to the MS or PhD in Veterinary Science program. Small group discussion of veterinary literature, peer-reviewed literature and textbooks covering biological basis of cancer diagnosis, therapy and treatment. S, F grading.

- 570 Special Topics** 1 May be repeated for credit; cumulative maximum 9 hours. Course Prerequisite: Admission to the MS or PhD in Veterinary Science program. Weekly small group discussions of problems in clinical veterinary medicine, surgery, or reproductive sciences using current literature and recent cases from Veterinary Teaching Hospital.

- 573 Special Topics in Equine Surgery** 1 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Admission to the MS or PhD in Veterinary Science program. Small group discussion and periodic laboratory/practical experience related to large animal surgery.

- 574 Cardiology Special Topics** 1 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Admission to the MS or PhD in Veterinary Science program. Clinical cardiology topics and special problems; current medical or interventional information.

- 576 Introduction to Veterinary Clinical Research** 2 Course Prerequisite: Admission to the MS or PhD in Veterinary Science program. Designing, executing, analyzing and reporting clinical research fundamental to practicing evidence-based medicine.

- 577 Applied Veterinary Physiology I** 2 (0-2) Course Prerequisite: Admission to the MS or PhD in Veterinary Science program. Review of physiology as it relates to clinical veterinary medicine and specific diseases of animals through analysis of recent medical literature.

- 578 Applied Veterinary Physiology II** 2 Course Prerequisite: VET CLIN 577; admission to the MS or PhD in Veterinary Science program. Continuation of VET CLIN 577.

- 579 Oncology Rounds Seminar** 1 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Admission to the MS or PhD in Veterinary Science program. Presentation and discussion of veterinary oncology cases include imaging, pathology, clinical pathology, appropriate diagnostic steps, therapy options and potential outcomes. S, F grading.
- 580 Advanced Clinical Pathology** 1 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Admission to the MS or PhD in Veterinary Science program. Weekly small group discussion of laboratory and cytologic abnormalities in recent cases from the Veterinary Teaching Hospital.
- 582 Seminar in Clinical Medicine** 1 May be repeated for credit. Course Prerequisite: Admission to the MS or PhD in Veterinary Science program.
- 584 Comparative Theriogenology** V 1-2 May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: Admission to the MS or PhD in Veterinary Science program. Lectures from WSU College of Veterinary Medicine and Department of Animal Sciences and from UI Department of Animal and Veterinary Sciences.
- 585 Selected Topics in Advanced Clinical Neurology** V 1-2 May be repeated for credit; cumulative maximum 10 hours. Course Prerequisite: Admission to the MS or PhD in Veterinary Science program. Advanced veterinary neurology as applied to clinical practice.
- 586 Diagnostic Ultrasound** 2 Course Prerequisite: Admission to the MS or PhD in Veterinary Science program. Diagnostic ultrasound and its application to clinical medicine in large and small animals.
- 587 Hospital Rotation** 3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Admission to the MS or PhD in Veterinary Science program. Supervised practical experience in all service areas of the veterinary hospital. Cooperative: Open to UI degree-seeking students.
- 589 Advanced Clinical Veterinary Medicine** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Admission to the MS or PhD in Veterinary Science program. Special topics.
- 590 Special Topics in Equine Medicine** 1 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Admission to the MS or PhD in Veterinary Science program. Weekly small group discussion of problems in equine medicine, surgery or reproductive medicine using current or recent case material from the Veterinary Teaching Hospital.
- 591 Advanced Clinical Diagnosis** V 1-3 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Admission to the MS or PhD in Veterinary Science program. Advanced course in systems clinical and laboratory examination.
- 592 Seminar** 1 May be repeated for credit. Cooperative: Open to UI degree-seeking students. S, F grading.
- 593 Anesthesia Seminar** 1 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Admission to the MS or PhD in Veterinary Science program. Critical review of current topics in veterinary anesthesia.
- 596 Advanced Radiology** 2 (1-3) May be repeated for credit; cumulative maximum 12 hours. Course Prerequisite: Admission to the MS or PhD in Veterinary Science program. Advanced study in the field of veterinary radiology and radiation treatment.
- 597 Diagnosis and Treatment of Surgically Correctable Soft Tissue Diseases in Small Animals** V 1-2 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Admission to the MS or PhD in Veterinary Science program. Review of recent advances in diagnosis and treatment of diseases in the field of small animal surgery.
- 598 Surgery Residents Seminar** 1 May be repeated for credit. Course Prerequisite: Admission to the MS or PhD in Veterinary Science program. Surgery residents' and interns' presentations of case reports, literature reviews and research. S, F grading.
- 599 Critical Analysis of Veterinary Medicinal Information: Illusional Medicine** 1 May be repeated for credit; cumulative maximum 6 hours. Course Prerequisite: Admission to the MS or PhD in Veterinary Science program. Weekly small group discussion, lecture and critical analysis of medical information.
- 600 Special Projects or Independent Study** V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. Cooperative: Open to UI degree-seeking students. S, F grading.
- 700 Master's Research, Thesis, and/or Examination** V 1-18 May be repeated for credit. Course Prerequisite: MS in Veterinary Science only. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.
- 702 Master's Special Problems, Directed Study, and/or Examination** V 1-18 May be repeated for credit. Independent research in special problems, directed study, and/or examination credit for students in a non-thesis master's degree program. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 702 credit. S, U grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Veterinary Science PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

Department of Veterinary Microbiology and Pathology

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Description of Courses

VETERINARY MICROBIOLOGY

VET MICR

499 Special Problems V 1-4 May be repeated for credit. Independent study conducted under the jurisdiction of an approving faculty member; may include independent research studies in technical or specialized problems; selection and analysis of specified readings; development of a creative project; or field experiences. Cooperative: Open to UI degree-seeking students. S, F grading.

535 Advanced Readings in Veterinary Microbiology 1 May be repeated for credit. Course Prerequisite: Admission to the MS or PhD in Veterinary Science program. Supervised reading program which peruses publications of intermediate technical difficulty and advanced textbooks.

541 Advanced Diagnostic Microbiology 1 (0-3) May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: VET MED 534; VET MED 535; VET MED 536. Microbiology laboratory for performing and interpreting virologic, serologic, and related tests for the diagnosis of animal diseases.

563 Deconstruction of Research 3 Course Prerequisite: Graduate standing in a WSU biomedical based graduate program. Nature and development of scientific investigation through oral and written avenues, and methods of critical analyses applied to questions of biomedical interest. (Crosslisted course offered as NEUROSCI 563, GLANHLTH 563, MBIOS 563, VET MICR 563, VET PATH 563, VET PH 563).

572 Advanced Topics in Microbiology, Parasitology, or Immunology V 1-3 May be repeated for credit; cumulative maximum 4 hours. Advanced topics in microbiology, parasitology, or immunology presented in short-course, or workshop format.

591 Seminar in Diagnostic Microbiology 1 May be repeated for credit; cumulative maximum 8 hours. Seminar in diagnostic veterinary microbiology.

592 Advances in Immunobiology 1 May be repeated for credit. Cooperative: Open to UI degree-seeking students.

600 Special Projects or Independent Study V 1-18 May be repeated for credit. Independent study, special projects, and/or internships. Students must have graduate degree-seeking status and should check with their major advisor before enrolling in 600 credit, which cannot be used toward the core graded credits required for a graduate degree. Cooperative: Open to UI degree-seeking students. S, F grading.

700 Master's Research, Thesis, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: MS in Veterinary Science only. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Veterinary Science PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.

VETERINARY PATHOLOGY

VET PATH

501 Case-based Learning in Veterinary Pathology V 1 (0-3) to 3 (0-9) Course Prerequisite: Admission to the MS or PhD in Veterinary Science program. Principles of pathophysiology, infectious disease, laboratory diagnosis, zoonoses, and food safety learned through the development of multistep teaching cases. S, F grading.

525 Introductory Readings in Veterinary Pathology 1 (0-3) May be repeated for credit; cumulative maximum 2 hours. Supervised introductory readings of publications, books, and research proposals.

542 Advanced Diagnostic Pathology V 1 (0-3) to 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. Course Prerequisite: VET MED 546. Necropsy laboratory for techniques and skills in performing and interpreting necropsy material.

544 Immunopathology 4 Course Prerequisite: VET MED 545; VET MED 531. The role of immune processes in the pathogenesis of disease.

545 Mechanisms of Disease 4 Course Prerequisite: VET MED 545; VET MED 531. Biochemical and immunological mechanisms involved in disease processes from the comparative standpoint.

548 Introduction to Research 1 Introduction to research.

555 Research in Progress Seminar 1 May be repeated for credit; cumulative maximum 8 hours. Presentation of on-going student research project results.

563 Deconstruction of Research 3 Course Prerequisite: Graduate standing in a WSU biomedical based graduate program. Nature and development of scientific investigation through oral and written avenues, and methods of critical analyses applied to questions of biomedical interest. (Crosslisted course offered as NEUROSCI 563, GLANHLTH 563, MBIOS 563, VET MICR 563, VET PATH 563, VET PH 563).

571 Advanced Topics in Pathology V 1-3 May be repeated for credit; cumulative maximum 4 hours. Advanced topics in pathology presented in short-course, or workshop, format.

592 Anatomic Pathology Seminar 1 May be repeated for credit. Histopathologic description and diagnosis.

700 Master's Research, Thesis, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: MS in Veterinary Science only. Independent research and advanced study for students working on their master's research, thesis and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 700 credit. S, U grading.

800 Doctoral Research, Dissertation, and/or Examination V 1-18 May be repeated for credit. Course Prerequisite: Admitted to the Veterinary Science PhD program. Independent research and advanced study for students working on their doctoral research, dissertation and/or final examination. Students must have graduate degree-seeking status and should check with their major advisor/committee chair before enrolling for 800 credit. S, U grading.



Appendix—Academic Regulations

Washington State University and its various colleges reserve the right to change the rules regulating admission to, instruction in, and graduation from Washington State University and any other regulations affecting the student body. Such regulations shall go into effect whenever the proper authorities may determine and shall apply to prospective students and to those who may at that time be enrolled.

UNDERGRADUATE ADMISSION REQUIREMENTS

1. GENERAL REQUIREMENTS

- (a) To be eligible for admission to Washington State University, an applicant must be a high school graduate or its equivalent, or have completed a more advanced transferable credential from a regionally accredited college or university (e.g., a transferable Associate of Arts or Associate of Science degree).
- (b) The total number of new students admitted for any one semester will be based on the number of students for whom facilities can be made available.
- (c) Appeal of admission decisions may be made only to the Admissions Subcommittee of the Academic Affairs Committee or its designee.
- (d) Anyone seeking admittance to the Graduate School must follow procedures in the Graduate School Policies and Procedures Manual available in the Graduate School.
- (e) The university reserves a limited number of spaces in the incoming class for the admission of students with extraordinary talents. Refer to the admission of students with extraordinary talents component of the Admissions policies section of the university catalog.

2. FRESHMAN REQUIREMENTS. Freshman applicants are considered for admission on the basis of their academic records and other supporting documents, which include official transcripts that show coursework through at least grade 11 or its equivalent, completion of the Washington College Academic Distribution Requirements (CADRs), test scores (ACT or SAT), and other relevant materials as requested or as may be provided. On the basis of these criteria, the most qualified applicants are offered admission.

A complete list of the Washington College Academic Distribution Requirements (CADRs) for admission may be found at the Washington Student Achievement Council's (WSAC) website, linked here www.cadr.wsu.edu.

Applicants from unaccredited high schools may contact the Office of Admissions for additional information.

ADVANCED STANDING (Transfer Applicants)

4. TRANSFER REQUIREMENTS

- (a) Applicants who have completed a transferable Associate's degree from a regionally accredited post-secondary institution will be admitted as space allows.
- (b) Applicants without a transferable Associate's degree, but with at least 27 semester (40 quarter) hours of transferable credit from a regionally accredited post-secondary institution normally will be admitted as space allows provided they have at least a 2.5 cumulative grade point average. Applicants whose cumulative grade point average is lower than a 2.5 may have their academic record reviewed more comprehensively to determine admission eligibility.
- (c) Applicants with fewer than 27 semester (40 quarter) hours of transferable credit will be considered for admission if they also meet the freshman requirements. Applicants whose cumulative transfer grade point average is lower than a 2.5 may have their academic record reviewed more comprehensively to determine admission eligibility.
- (d) In evaluating admission credentials of students with transfer work whose cumulative transfer grade point average is below a 2.00, all of the post-secondary transfer credit from a previous institution may be disregarded, provided the work was completed not less than four years before the time of enrollment at Washington State University. Application of this policy is contingent upon the evidence of extenuating circumstances that present a significant probability of future academic success. The Faculty

Admissions Subcommittee or its designee in the Office of Admissions will consider these admission requests. After the student has completed 15 semester hours of satisfactory work at WSU, the student may petition to restore the credits previously withheld. All credit earned in courses graded C or better will be considered for restoration and, if approved, only the courses and credit (not grades or grade points) will be restored.

6. TRANSFER CREDIT. (See Rule 114)

- a) Colleges and universities must be regionally accredited for college-level academic transfer credit to be awarded.
- b) Ninety semester hours shall be the maximum allowed by transfer toward a baccalaureate degree.
- c) The maximum combined lower-division transfer credit allowed [from regionally accredited institutions, CLEP (College Level Examination Program), AP (Advanced Placement), IB (International Baccalaureate), Cambridge International, military credit, and any other source] shall be 73 semester credit hours toward a baccalaureate degree irrespective of when those hours were earned.
- d) Junior status, 60 semester credit hours, and completion of lower-division University Common Requirements (UCOREs) normally will be granted to students who have been awarded the Direct Transfer Associate (DTA) degree from a Washington community college. Additional courses, up to the 73 semester hour limit, will be reviewed for transfer on a course-by-course basis. The Associate of Arts—Oregon Transfer (AAOT) degree from an Oregon community college guarantees completion of the lower-division University Common Requirements (UCOREs), but does not guarantee junior status or 60 semester credit hours. Certain approved associate degrees from Arizona, California, Hawaii, and Idaho may also be considered to have fulfilled the lower-division University Common Requirements (UCOREs) for graduation, but do not guarantee junior status or 60 semester credit hours. For details on specific degrees consult the Office of Admissions.
- e) Students who enter WSU with at least 60 transferable quarter credit hours and later complete one of the associate degrees listed in Rule 6 (d) or (f) will receive the benefits described in Rule 6 (d) or (f).
- f) Students who have completed the Associate of Science Transfer (AST) degree from a Washington community college normally will receive the same priority consideration for admission as they would for completing the Direct Transfer Associate (DTA) and will be given junior status and 60 semester credit hours. Up to four additional courses that meet the University Common Requirements (UCOREs) must be met prior to the completion of a baccalaureate degree. Additional courses, up to the 73 semester hour limit, will be reviewed for transfer on a course-by-course basis.
- g) Completion of lower-division University Common Requirements (UCOREs) will be granted to students who have been certified by their institution as having completed the lower-division general education curriculum at another regionally accredited Washington baccalaureate institution.
- h) Completion of lower-division University Common Requirements (UCOREs) will be granted to students who have been certified by their institution as having completed the University of California Intersegmental General Education Transfer Curriculum (IGETC) or the California State University General Education Breadth Curriculum.
- i) Completion of all University Common Requirements (UCOREs) will be granted to students who have completed a baccalaureate degree from another regionally accredited institution, provided that the general education program approximates that at WSU.
- j) Other degrees, including international degrees, will be evaluated on a course-by-course basis for fulfillment of requirements, in the absence of an approved articulation. Higher degrees do not necessarily fulfill baccalaureate degree requirements.

9. GRADE POINTS REQUIRED. Students entering with advanced standing must earn twice as many grade points for graduation as the number of hours which they have enrolled in this or any other institution.

14. **CREDIT FROM INSTITUTIONS WITHOUT REGIONAL ACCREDITATION.** Students who have taken college-level, academic work at institutions that are not regionally accredited but are nationally accredited may petition for transfer of appropriate credits. Petitions may be filed after the student has completed a minimum of one semester (minimum of 15 credits) of satisfactory work at Washington State University. To receive credit, a student must have earned a minimum grade of C in the course for which he or she is requesting transfer credit. Petitions are reviewed and approved first by the Department Chair and then by the College Dean from the unit that offers courses in that discipline. The Vice Provost or designee reviews and approves petitions in cases where there is no equivalent WSU unit. Following approval by the Department and College (or Vice Provost or designee), the petition is then forwarded to the Chair of the Admission Subcommittee for review and approval. Students may contact the Office of Admissions for more information.

15. **CREDIT BY EXAMINATIONS.** Subject to standards established in consultation with academic departments concerned, credit may be granted to entering or enrolled undergraduate or professional students via various means including external examinations, institutional examinations, approved military service schools, and prior learning assessment.

Prior learning is defined as the knowledge and skills gained through work and life experience; through military training and experience; and through formal and informal education and training from in-state and out-of-state institutions, including foreign institutions. Prior learning assessment is the process used to evaluate such experience for academic credit.

WSU does not accept credit by examination as transcribed by other institutions. Students must provide official score reports to WSU.

Credits by examination shall yield no grade points. Such credits may partially fulfill University Common Requirements (UCOREs) for graduation. External examinations will include but not be limited to: Advanced Placement (AP) Program examinations of the College Entrance Examinations Board; general and subject College Level Examination Program (CLEP); the International Baccalaureate (IB) Examinations; and Cambridge International Examinations.

Students may request to take a course at WSU for which they have been awarded AP, IB, CLEP, or Cambridge International credit. Prompted by the request, the AP, IB, CLEP, or Cambridge International credit is removed from the overall credits awarded by WSU. Only the subsequent enrollment in the WSU course will contribute to the total hours earned and grade point average; the AP, IB, CLEP, or Cambridge International credit cannot be reconsidered for credit for the same course. Students submit the request to ask for the WSU course to be allowed and for the AP, IB, CLEP, or Cambridge International credit to be omitted to the Registrar's Office.

- (a) **Advanced Placement Program.** Credit for AP examinations will be granted in an amount equal to the lower-division course or courses in the particular discipline tested, as determined in consultation with the specific academic department. The acceptable score for receiving credit is published online at wsu.edu/advancedcredit.
- (b) **College Level Examination Program (CLEP).** General and Subject Examinations: Credit for CLEP will be granted if the examination is passed with scores established in consultation with the academic department concerned. Credit will be granted for scores of 50 or above. Credit will be granted for the comparable Washington State University course, or elective credit may be granted. Not more than 6 semester hours of credit will be granted for each examination.
- (c) **Challenge Examinations.** Matriculated students currently registered at Washington State University, with permission of their advisor or department chairperson and of the chairperson of the department offering the course, may take challenge examinations for university credit in courses in which they are not registered. Students may not take challenge examinations in courses which they have audited, or in which they have received a final grade. Upper-division students may not receive credit by challenge examination in lower-division courses in their major field. Undergraduate students may not receive credit by challenge examination in any course prerequisite to a course in which they are enrolled or have received a final grade. The maximum credit for challenge examinations is 30 semester hours unless permission is obtained from the student's academic dean. Consult the Registrar's Office for challenge exam fees.
- (d) **Peace Corps and Volunteers in Service to America (VISTA) Credit** for training in the Peace Corps or VISTA will be granted for having completed

specific courses, under regular catalog course numbers, as shown on a regular transcript from a regionally accredited college or university.

- (e) **WSU Placement Examinations.** Credit for WSU departmental placement examinations will be granted in accordance with policies established by the university and academic departments.
- (f) **International Baccalaureate (IB) Examinations.** Credit is awarded for higher-level examinations with a score of 4 or higher. See wsu.edu/advancedcredit. Upon completion of the IB diploma, 30 lower-division semester credit hours are awarded, in partial fulfillment of University Common Requirements (UCOREs).
- (g) **Cambridge International Examinations.** Credit is awarded for A-level examinations.

16. **MILITARY CREDIT.** Credit will be evaluated on the basis of military transcripts received from active duty military and veterans pursuing an education at WSU.

(1) **Transcript Credit:**

- (a) WSU uses the American Council on Education (ACE) "A Guide to the Evaluation of Educational Experiences in the Armed Services" as a framework for evaluating transferable credit documented on military transcripts.
- (b) ACE recommendations for the amount and level of credit (upper-division or lower-division) are followed if the military course (non-vocational/technical) is applicable to university or departmental requirements.
- (2) **DANTES Test Credit:** Credit for DANTES Subject Standardized Tests (DSSTs) will be granted for college-level academic subjects (non-vocational/technical) using the minimum score and credit amount recommendations of the American Council on Education.

As noted in Academic Regulation 6, Transfer Credit, lower-division transfer credit is limited to 73 semester credits from all sources (transfer, credit by exam, military, other), and total transferable credit is limited to 90 semester credits.

AUDITING CLASSES

20. **PERMISSION TO AUDIT.** An auditor is a student who is permitted on a space-available basis to observe class discussions but not take examinations or consume the instructor's time.

Attendance in class as an auditor requires official approval and enrollment. Students may seek permission, after the start of classes, to audit a lecture course by securing the approval and signature of the class instructor on the Registrar's Enrollment Change Form. Students may not attend classes as auditors past the second Friday of the semester (census day), or past the add deadline for shorter academic sessions, without being on the official class roster.

Students wishing to audit must pay the appropriate fee and bring the signed Enrollment Change Form to the Registrar's Office at the student's home campus by the end of the second week of instruction. Students wishing to change their enrollment status from credit to audit, or audit to credit, must submit the Enrollment Change Form by the end of the second week of instruction.

A maximum of two audits are allowed for any semester or term. A registration fee per audit hour is charged for any semester or term for other than regularly enrolled full-fee-paying students. Senior citizens are exempt from this fee under the provisions of RCW 28B.15.540, provided the prescribed eligibility requirements are met. Personnel who have received authorization for the faculty/staff fee waiver are exempt from the audit fee up to 6 hours (including audits) in any one semester or 4 hours (including audits) in the summer session. The limitation includes any combination of credit and audit hours. The audit fee is non-refundable.

21. **NO CREDIT FOR AUDITING.** No university credit will be allowed for auditing courses, nor may students apply for or take special examinations for university credit in courses which they have audited. Students may not take challenge examinations (see Rule 15c) in courses they have audited. (Audit enrollments will be recorded on the student's permanent record by listing the departmental prefix, course number and the statement, "Audit Only -- No Credit Given.")

CLASS STANDING OF STUDENTS

25. **CLASS STANDING.** First-Year Student Standing—below 30 semester hours; Sophomore Standing—30 to 59 1/2 hours; Junior Standing—60 to 89 1/2 hours; Senior Standing—90 and above hours.

CREDIT

27. **CREDIT DEFINITION.** Academic credit is a measure of the total minimum time commitment required of a typical student in a specific course. For the WSU semester system one semester credit is assigned for a minimum of 45 hours. The expected time commitment may include: 1) time spent in scheduled course activities organized by an instructor (lectures, discussions, workbooks, videotapes, laboratories, studios, fieldwork, etc.); 2) time spent in group activities related to course requirements; and 3) time spent in reading, studying, problem solving, writing, and other preparations for the course. The minimum in-class time commitment, based on a fifteen-week semester and a traditional format, should follow these guidelines: 1) lecture--one hour of lecture per week for each credit hour; 2) laboratory--three hours of laboratory per week for each credit hour; 3) studio--two hours of studio work per week for each credit hour; 4) ensemble--four hours of ensemble work per week for each credit hour. The minimum time commitment for independent study is three hours of work per week for each credit hour. Courses taught in different time frames than the fifteen-week semester or in a different format need to define how the time commitment leads to the achievement of stated course goals. Achievement of course goals may require more than the minimum time commitment.

28. **HIGH SCHOOL STUDENTS.** High school students may enroll at Washington State University provided they are admitted to the university and pay the appropriate fees. Such enrollments may be for high school or university credit or both. For fall and spring semesters, all eligible high school students enroll through Running Start. For Summer Session, special fees may apply.

29. **WORK FROM HIGH SCHOOLS AND VOCATIONAL BUSINESS COLLEGES.** No university credit shall be given for work from high schools or vocational business colleges. Recognized exceptions are College Board Advanced Placement (AP) and International Baccalaureate (IB), for which official score reports are required to award credit. Students are awarded transfer credit for Running Start (RS), College in the High School (CHS) and similar programs only when official college transcripts are presented. Credit is not granted on the basis of the high school transcript.

31. **CREDIT TO HIGH SCHOOL STUDENTS FOR COURSES COMPLETED PRIOR TO HIGH SCHOOL GRADUATION.** Washington State University encourages students to complete rigorous college preparatory courses in high school, or to take college courses while in high school if they have adequate preparation. In some cases college credit may be awarded when consistent with the following criteria.

- (a) **High School Courses:** Some high schools may offer instruction at the college level, and when consistent with university and academic department policies, college credit will be awarded if student achievement is validated by an approved national examination such as Advanced Placement or International Baccalaureate or Cambridge International, or a review or examination administered by the university.
- (b) **Running Start Program:** Credit will be awarded for college courses taken prior to high school graduation when such courses are completed through the state of Washington's Running Start Program.
- (c) **Other Courses:** College credit may be awarded for courses taken in high school when consistent with the following conditions:
 - (1) The course must also be currently available on the campus of the regionally accredited college or university and must be listed in the college or university catalog. The course, regardless of setting, must use the college or university curriculum.
 - (2) Students interested in credit must register and pay fees at the beginning of the term and would be subject to the same grading and tuition refund policies as students on the campus of the regionally accredited college or university.
 - (3) The faculty teaching the course in high school must carry a regular or adjunct faculty appointment at the regionally accredited college or university.
 - (4) The students taking the course in the high school must be assessed and graded in the same manner as students taking the course on the campus of the regionally accredited college or university. Student work, whether completed for the course offered on-campus or at the high school, must be graded and evaluated by the same standards.

34. **REPEAT COURSES.** Students may repeat a course in which they have received a grade of C- or below, or a withdrawal (W), or when a course may be repeated for additional credit. Students may enroll more than once in the same course in any given term (fall, spring, or summer) provided that the particular periods of enrollment do not overlap and that other conditions for allowed repeats are met.

- a. **Repeating courses graded C- or below.** To attempt to improve the cumulative grade point average, a student may repeat courses in which a C- or below was received. When such a course is repeated, only the last grade contributes to the grade point average and total hours earned. Students may repeat a course graded C- or below one time at WSU. Additional repeats are allowed at WSU by special permission of the academic unit offering the course. Repeats are allowed as transfer credit from another institution. However, the series of repeats and grades is retained on the student's academic record.
 1. Only courses identified as acceptable equivalents according to the appropriate department, the Transfer Guide, or the Admissions Office are treated as repeats. If courses deemed equivalent in content differ in credit hours, the credit hours of the repeat course supersede the credit hours of the original course.
- b. **Repeating for additional credit.**
 1. Some courses have been approved for repeat credit, i.e., the student may re-enroll in the course during a subsequent term and credit may be accumulated. Such courses are designated in the WSU catalog as "May be repeated for credit" and will list the maximum credit limitation.
 2. Courses which have been approved for repeat credit, such as topics, may offer multiple sections of a course during any one term. Students may enroll in more than one section of these courses in any one term provided that the specified particular topics and titles differ.

UNDERGRADUATE ACADEMIC DEFICIENCY

35. Washington State University expects students to maintain academic standards of excellence and make satisfactory academic progress toward their degree objectives. Undergraduate students are in good academic standing if both their current WSU semester and cumulative grade point averages are 2.00 or above, and/or they are eligible to be enrolled. Students not meeting the criteria above are considered academically deficient.

38. Undergraduate students whose semester (excluding summer session) or cumulative grade point average drops below a 2.0 for the first time must apply for reinstatement to continue their enrollment at Washington State University. Students are placed on academic probation after reinstatement. Certified majors on academic probation may be decertified by the academic department.

39. Undergraduate students are dismissed from the university after the third semester (excluding summer session) in which the cumulative grade point average is below 2.0. Individuals who are dismissed from the university must wait a minimum of two full semesters (fall/spring, spring/fall) to reenroll for courses offered through any WSU campus. Dismissed individuals may not seek status as a 'non-degree seeking student.' Dismissed students may enroll in summer session.

40. Former students may seek reinstatement after two semesters by completing the academic reinstatement petition process. Former students petitioning for academic reinstatement must, as part of the reinstatement petition process, provide documentation that demonstrates potential for academic success at WSU. If seeking reinstatement after more than two semesters, former students must also apply for readmission to the university through the Office of Admissions. All academic coursework from other institutions completed during dismissed status must be documented and official transcripts submitted to the Office of Admissions.

41. An undergraduate student who has been reinstated after becoming deficient under Rule 38 or 39 will be on academic probation. The specific conditions of enrollment for students who are on official probation will be determined by the interviewer or Review Board. Students on probation who fail to comply with the conditions of their probationary enrollment will be dismissed from the university.

42. Students enrolled in professional programs (e.g., clinical courses in nursing) that involve human health care may be subject to more stringent requirements in grading, repeating course work, and retention provided the more stringent requirements are approved through Faculty Senate channels and are published and are made available to students prior to certification. Students are referred to the nursing and pharmacy offices for specific requirements.

43. Former WSU students, dismissed under any academic deficiency rule, who have not been enrolled at WSU for four years or more may request at the time that they apply for readmission and reinstatement that all previous WSU work be disregarded. This includes all credits and grade points earned. Once the student is officially enrolled following the first day of the term, the student's transcript will be marked to indicate that the previous work is not considered as credit earned. After the subsequent completion of 15 semester hours of course work with a cumulative grade point average of 2.0 or higher at WSU, the prior credits earned in courses graded C or better will be restored. Only the courses and credit, not grades or grade points, will be restored. Requests for reinstatement for former WSU students will be considered by the Review Board in the Academic Success and Career Center on the Pullman campus, WSU Online, or designated office on other campuses.

CONDUCT

45. Washington State University is guided by a commitment to excellence embodied in a set of core values. The university aims to create an environment that cultivates individual virtues and institutional integrity in the community. The mission of the university is supported when students uphold and take responsibility for the full scope of these values. The university's core values are identified in its strategic plan. Under the terms of enrollment, students acknowledge the university's authority to take disciplinary action for conduct on or off university property that is detrimental to the university's core values. Students who violate the university Standards of Conduct are subject to discipline, which may include temporary or permanent removal from the university. (See the Standards of Conduct for Students.)

46. **PENALTY FOR ACADEMIC DISHONESTY.** Cases of academic dishonesty shall be processed in accordance with the Academic Integrity Policy, as printed in the Student Handbook and the Faculty Manual and as available from the Office of Student Standards and Accountability.

ENROLLMENT, REGISTRATION, DROPPING COURSES, AND WITHDRAWALS

47. **PLACEMENT TESTS.** All students will be required to take the regulation placement tests as a prerequisite to enrollment in appropriate courses.

50. **PASS, FAIL GRADING OPTIONS.** Pass, fail options are available for undergraduate and graduate students. The advisor's approval is required for undergraduates. No courses designated as meeting University Common Requirements (UCORES) may be taken pass, fail by any undergraduate. No more than two courses may be taken on a pass, fail basis during any given semester. Two courses is the limit for summer session.

A total of six courses may be taken on a pass, fail basis by students initiating and completing work for a baccalaureate degree at Washington State University. Students in the College of Veterinary Medicine with advisor approval may enroll for a total of six courses in the professional curriculum on a pass, fail basis, subject to the regulations listed above. University Honors College courses may be taken on a pass, fail basis only with the permission of the University Honors College Dean.

Class 5 (except those working on a second baccalaureate degree) and Class 6 (graduate) students are eligible to take courses on a pass, fail basis, but such work cannot be in the student's official degree program or used for removal of a specific undergraduate deficiency. Credit hours earned under pass, fail are counted toward assistantship minimum hour requirements. There is no limit on the number of hours a graduate student may take on a pass, fail basis.

Allowances for transfer students are as follows:

Transfer status upon entering WSU—Pass, fail Allotment

1-44 credits six courses allowed pass, fail

45-59 credits five courses allowed pass, fail

60-74 credits four courses allowed pass, fail

75-89 credits three courses allowed pass, fail

90 and above credits two courses allowed pass, fail

A student may change a pass, fail enrollment to a regular letter-graded enrollment, or vice versa, during the first three weeks of classes in a semester. After the third week and through the last day of instruction in a semester (end of the 15th week), only a pass, fail enrollment can be changed to a letter-graded enrollment.

The P (pass) grades earned by pass, fail enrollees will not be included in computing the grade point average; however, F grades earned by pass, fail enrollees will be included in grade point average computations. Departments and programs may deny their majors permission to take, on a pass, fail basis, courses in their major field or courses needed to meet departmental requirements. Departments have the prerogative of requesting, from the Office of the Registrar, the letter grade for courses a prospective major has taken on a pass, fail basis. Departments and programs may refuse to accept courses needed to meet the above requirements if the courses were completed on a pass, fail basis before the student was accepted into the department or program.

52. **PREREQUISITE COURSES.** All prerequisites shall be satisfactorily completed before the student may register in a course. At the time of registration for an upcoming term, in-progress enrollment counts toward meeting prerequisites. If after grades are entered a prerequisite is no longer met, the course is dropped from the student's enrollment.

The instructor may waive the prerequisite in the case of a student who has demonstrated competence or who has had academic experience equivalent to that represented by the prerequisite. However, no student may have the prerequisite waived if the academic unit deems the waiver inappropriate.

53. **MAJOR AND CERTIFICATION.** The undergraduate major is the in-depth field of study leading to the degree and includes a set of core courses that has been approved by the academic unit offering the major, as well as the college, and the Faculty Senate. The major represents approximately one-third of the credit hours required for the undergraduate degree, though some majors require a higher percentage of the total credit hours. While most majors lead to a degree that shares the same name, some majors lead to a degree with a broader title (e.g., an Accounting major leads to the Bachelor of Arts in Business Administration).

Certification requirements: The minimum university requirement for certification in a major is completion of 24 semester hours with a 2.00 grade point average. Academic units may hold students to additional requirements, such as additional semester hours, a higher grade point average, or completion of specific courses. Typically, students with 60 or more semester hours should be certified into a major. Students are certified in an academic major with the approval of the academic unit, and upon notification to the appropriate office on their respective campus.

Consult the catalog for specific major and certification requirements.

54. **UNDERGRADUATE MINOR OR ADDITIONAL MAJOR.** Undergraduate minors and additional majors emphasize study in an area outside a student's primary major. An undergraduate minor or additional major is a supplemental academic award that is awarded at the same time that a student's primary major is completed and the undergraduate degree is conferred.

Students should consult with the department concerning specific certification requirements and restrictions for these supplemental academic awards. The following general provisions apply:

a. Minors:

- (1) An undergraduate student who has completed 60 semester hours and is certified in a primary major may certify in a minor with the approval of the offering department.
- (2) An undergraduate minor requires a minimum of 16 semester hours, 9 of which must be in upper-division work and taken in residence at WSU or through WSU-approved education abroad or educational exchange courses.
- (3) Unless otherwise noted by the certifying department, courses forming a minor may also be used to satisfy the requirements of a major.
- (4) No student shall be required by their major to complete a minor, though the department may encourage students to complement the primary major with a minor.
- (5) Students may not be certified in a minor, or awarded a minor, if it carries the same name as any other current certifications or completed academic

awards. This includes current or completed certification in any area of study, such as degrees; majors; or options, concentrations, or subplans within the major. However, a student who has earned a minor may be subsequently certified by a department to seek a higher academic award (e.g., a student who has earned a minor in English may later return to seek a degree in English).

b. Additional Majors:

- (1) An undergraduate student who has completed 60 semester hours and is certified in a primary major may certify in an additional major with the approval of the offering department.
- (2) An additional major requires completion of departmental requirements for the major, exclusive of general education requirements.
- (3) Students may not be certified in an additional major, or awarded an additional major, if it carries the same name as any other current certifications or completed academic awards. This includes current or completed certification in any area of study, such as degrees; majors; options, concentrations, or subplans within the major; or other supplemental academic awards, such as minors. However, a student who has earned an additional major may be subsequently certified with departmental approval to seek a higher academic award (e.g., a student who has earned an additional major in Spanish may later return to seek a degree in Foreign Languages, with a major in Spanish).
- (4) Note that for each additional baccalaureate degree, students must complete an additional 30 semester hours. See Rule 118.

55. CHANGE OF MAJOR. A student may change from one department to another only on approval of the chairpersons of the departments or deans concerned.

56. DECERTIFICATION AND RECERTIFICATION. A certified major who becomes academically deficient under Rules 38 or 39 and is decertified by the major department or program will be eligible to recertify, on a space-available basis, when the cumulative and major grade point averages are at or above the minimum level required for certification into the department.

A certified major who falls below the minimum departmental requirements (approved by Faculty Senate) may be decertified by the department after two semesters of falling below that minimum. The department must notify the student at the end of the first semester and establish conditions in writing that must be met the second semester. If conditions are not met at the end of the second semester, documentation must be provided to the Academic Success and Career Center along with the request to decertify a student.

57. STUDENT PETITIONS FOR EXCEPTIONS TO ACADEMIC CALENDAR DEADLINES AND WITHDRAWAL LIMITS. Students may, with the payment of a service fee, petition for exceptions to the academic calendar deadlines (e.g., withdrawal after the deadline) or petition for withdrawal from an individual course after the student has used the maximum number allowed. Petitions are considered only in the case of extraordinary circumstances such as a medical emergency and require supporting documentation. Further information is available at the Registrar's Office website under the link for Petitions.

Undergraduate and professional students may petition through the Registrar's Office. Graduate students may petition through the Graduate School.

Petitions for exceptions to the academic calendar deadlines and withdrawal limits must be made within two years of the date of enrollment in the course.

61. LATE SERVICE FEE. A student who does not enroll before classes start or pay fees on or before the due date will be assessed a service charge. A charge of \$100.00 will be assessed to late registrations that occur after the tenth day of classes. Late payment fees will be assessed those who pay tuition and fees after the due dates.

66. ADDING A COURSE. Students may add course enrollments through the fifth day of the semester. (NOTE: If the course is being added pass, fail the approval of the student's faculty advisor is also required.)

After the fifth day of the semester, students may add course enrollments only with the permission of the instructor.

67. DROPPING A COURSE. A student may drop a course without record up to the end of the 30th day of the semester in which the course is offered or according to a prorated schedule for shorter academic terms.

68. WITHDRAWAL FROM A COURSE. An undergraduate or professional student may withdraw from a course after the 30th day of the regular term up through the end of the 13th week with these provisions:

- (a) At the end of each term, the number of withdrawals will be counted for undergraduate and professional students. Once four withdrawals have been used, no further withdrawals will be allowed in subsequent terms. Withdrawals that result from the cancellation of enrollment will not be counted. (For those entering WSU in fall 1998 through summer 2004, once six withdrawals have been used, no further withdrawals will be allowed in subsequent terms.)
- (b) After the withdrawal limit is reached, an undergraduate or professional student may, in exceptional circumstances, submit a petition through the Registrar's Office for an exception to the withdrawal limit. See Rule 57.
- (c) If a grade has been entered for a course, the grade may not be changed to a withdrawal without the instructor's consent.
- (d) Withdrawals do not reduce tuition charges.
- (e) For academic calendars that vary from the regular 15-week term, a prorated schedule will be used to determine the withdrawal deadline.
- (f) The grade shall be marked W, and payment of the service fee shall be mandatory.

Graduate students who wish to request a course withdrawal after the 30th day must do so through the Graduate School.

70. CANCELLATION OF ENROLLMENT. Students who wish to withdraw from the institution and disenroll from all of their classes initiate the cancellation online through the Registrar's Office website, cancel.wsu.edu. Students seeking to cancel their enrollment after completing one or more courses may petition for an exception to the academic calendar deadlines in the event of extraordinary circumstances (see Rule 57).

- (a) Students canceling their enrollment during the first four weeks of the semester will have their permanent records marked "withdrew (date)." (Individual course enrollments will not be recorded.)
- (b) Students canceling their enrollment after the fourth week through the last day of instruction (end of the 15th week) will have their permanent records marked "withdrew (date)," and a grade of W will be recorded for each course enrollment.
- (c) Students on academic probation during the semester of their cancellation must obtain permission of the Academic Success and Career Center to re-enroll.

ATTENDANCE

71. ADMISSION TO CLASSES. Students are not permitted to attend a class past the second Friday of the semester (census day), or past the add deadline for shorter academic sessions, without being on the official class roster.

72. CLASS ATTENDANCE DURING THE FIRST WEEK TO ENSURE ENROLLMENT. Students who have not attended class and laboratory meetings during the first week of the fall or spring semester, or according to a prorated schedule for shorter academic terms, will be dropped from the course by the department. Students should not assume that they have been dropped without verification from the department or Registrar's Office. Students who believe that they have extenuating circumstances which prevent their attendance during the first week should notify the Dean of Students or Student Services. That office will notify instructors of the absence and the reason for it. Instructors shall determine whether to accept the excuse, waive the absence, and permit make-up work.

73. ABSENCES. Absences impede a student's academic progress and should be avoided.

- (a) **UNIVERSITY SPONSORED.** Any student who is required to participate in off-campus, university-sponsored activities such as field trips, musical performances, judging teams, intercollegiate athletic events, etc., should obtain an official Class Absence Request form from the faculty or staff member supervising the off-campus activity. The form must contain specific information concerning the activity and date, be signed by the supervising faculty or staff member, and be submitted by the student at least one week in advance to the individual instructors of the student's classes. It is requested that a student not be penalized for absence from class provided a properly signed Class Absence Request form has been filed with the instructor prior to the absence. These university sponsored absences are subject to an instructor's attendance policy and are not

intended to imply additional acceptable absences. In all instances, it is the student's responsibility to make up all work missed. Problem cases should follow the Academic Complaint Procedures, Rule 104.

- (b) **MILITARY SERVICE MEMBERS.** Students who are members of the National Guard or a reserve branch of a military service are occasionally required to miss class for weekend drills, active duty, and related responsibilities. In such a case, instructors should not penalize the student for the absences and should work with the student to make-up the missed assignment or examination. In each instance, it is the responsibility of the student to inform the instructor of the duty before the absence and complete the missed work as soon as reasonably possible.
- (c) **OTHER EXCUSED ABSENCES.** Students must sometimes miss examinations or other academic obligations affecting their grades because of illness, personal crises, mandated court appearances, parental responsibilities, and the like. As long as such absences are not excessive, it is recommended that the instructor provide and document reasonable accommodation. The instructor may require the student to submit a written explanation of the absence, but written excuses from health care personnel should not be required since these requests frequently put the health care personnel in untenable positions. A student who is dissatisfied with the instructor's accommodation may follow the Academic Complaint Procedure, Rule 104. It is recommended that the instructor explain the procedures for excused absences early in the semester, preferably in a written syllabus distributed to all students in each class. Once announced, these procedures should be scrupulously followed unless extraordinary circumstances require an exception. Students who attempt to gain advantage through abuse of this policy (e.g., by providing an instructor with false information) may be referred to the Office of Student Standards and Accountability for disciplinary action.

EXAMINATIONS

74. **FINAL EXAMINATIONS WEEK.** The final examination week for each fall and spring semester will span five days, from the Monday through the Friday immediately following the 15th week of the semester. Special examinations will be scheduled for the Saturday following the Friday of final examination week. Summer Session final exams will be confined to the designated class meeting times scheduled for the course or lab.

75. **FINAL EXAMINATION SCHEDULE.** The final examination schedule will be determined before the start of each semester and published in the semester schedule of classes by the Registrar based on previous enrollment for that semester. After publication, the schedule cannot be altered except as provided.

76. **SPECIAL PERIODS FOR FINAL EXAMINATIONS.** During examination week time will be allowed to large courses for special examinations of the entire group. The privilege of giving such special examinations is necessarily limited in terms of periods available for such tests. The courses having the greatest number of students will be given first opportunity to utilize the special examination periods available.

77. **THREE OR MORE IN ONE DAY.** During final examination week, if the scheduled arrangement results in students having three or more examinations scheduled for any one day, any one of their instructors is authorized to excuse the students from the regularly scheduled examination and give a final examination to the students during the special exams time blocks.

In cases of difficulty in arriving at a solution, students shall refer the matter to the chairpersons of their departments or to their academic advisors.

78. **CLOSED WEEK.** No examinations or quizzes (other than laboratory examinations, make-up examinations and make-up quizzes) may be given during the last week of instruction.

79. **NO EARLY EXAMINATIONS.** A student will not be granted special examinations for the purpose of leaving the institution before the close of the semester.

80. **SCHEDULING ALL COMMON EXAMINATIONS.** Instructors wishing to schedule examinations outside of normal class periods have two options: common examinations (Rule 80) and out-of-class examinations (Rule 81).

Both of these options must yield priority to officially scheduled class meetings, including lectures, labs, and studios. For example, if a common examination is scheduled during a student's lab time in another course, the instructor must accommodate the student by offering alternate examination times.

Common examinations may be requested for courses having an enrollment of at least two percent of the total student body or undergraduate courses with multiple lecture sections.

Up to four common examinations may be scheduled outside the official class meeting time each semester. Common examination periods may be scheduled at the following time blocks:

Monday and Friday: 7:00 to 8:00 a.m.; 5:00 to 7:00 p.m.; and 7:00 to 9:00 p.m.

Tuesday, Wednesday, and Thursday: 7:00 to 8:00 a.m.; 6:00 to 8:00 p.m.; and 8:00 to 10:00 p.m.

One class period shall be omitted to compensate for each common examination given. A class period lost to Labor Day, Veterans Day, Martin Luther King, Jr. Day, Presidents Day, Memorial Day, Independence Day holiday(s), and/or any other class day omitted from the academic calendar may be counted toward this compensation for a common examination.

For prioritized scheduling, proposed common examination dates and times must be submitted to the Registrar's Office no later than April 1 for fall semesters and no later than October 1 for spring semesters. Common examination times will be confirmed no later than the Friday before priority registration for the future semester. Later requests for common examination dates will be accommodated through the first week of the semester, on a space-available basis.

In cases where an alternate time may be needed to accommodate conflicts, instructors may contact the Registrar's Office for that additional scheduling.

81. **SCHEDULING OUT-OF-CLASS EXAMINATIONS.** Instructors wishing to schedule examinations outside of normal class periods for a course that doesn't meet the criterion of common examinations (see rule 80) may request out-of-class examinations. Officially scheduled class meetings, including lectures, labs, and studios, and common exams have priority over out-of-class examinations.

Departments may schedule up to four out-of-class examinations at a fixed time for undergraduate (100-400-level) courses. Out-of-class examination periods may be scheduled at the following time blocks:

Monday and Friday: 7:00 to 8:00 a.m.; 5:00 to 7:00 p.m.; and 7:00 to 9:00 p.m.

Tuesday, Wednesday, and Thursday: 7:00 to 8:00 a.m.; 6:00 to 8:00 p.m.; and 8:00 to 10:00 p.m.

One class period shall be omitted to compensate for each out-of-class examination given. A class period lost to Labor Day, Veterans Day, Martin Luther King, Jr. Day, Presidents Day, Memorial Day, Independence Day holiday(s), and/or any other class day omitted from the academic calendar may be counted toward this compensation.

Instructors wishing to schedule out-of-class examinations may submit the request beginning the first week of the term. The scheduling priority will be common examination times followed by out-of-class examination on a space-available basis. Except as noted for common examinations as per Rule 80, Rule 81 applies to any out-of-class examination scheduled to be taken at a fixed start and end time, including online examinations.

In cases where an alternate time may be needed to accommodate conflicts, instructors may contact the Registrar's Office for that additional scheduling.

82. **ACCOMMODATIONS OF RELIGIOUS OBSERVANCES IN THE ADMINISTRATION OF EXAMINATIONS.** Washington State University is committed to providing people of diverse religious backgrounds access to education. In addition, law requires reasonable accommodation of religious beliefs and practices. Because religious observances do not always conform to state and university holidays, tests or examinations that fall on these religious observances require reasonable accommodation. The university will provide reasonable accommodation consistent with the fair, efficient and secure administration of its programs. When tests or examinations fall on one or two days objectionable to a student because of religious beliefs, the student shall provide the instructor written notice 14 calendar days prior to the holiday. The written notice shall specify the date(s) and the reasonable accommodation requested. If the request appears to be made in good conscience, the instructor shall make alternate arrangements for administration of the examination or test, considering the integrity of the testing process and fairness to all the students. The instructor shall inform the student of the decision in writing within seven

calendar days of the receipt of the request. Any student who believes that she or he has not been appropriately accommodated under this policy may seek review of the decision by sending a written request to the chairperson of the department offering the course, as soon as possible and no later than seven days after learning of the instructor's decision. After the chair's decision, the student or the instructor may appeal to the dean's office. Appeals to the dean's office must be presented in writing within seven calendar days of the chair's decision. The decision of the dean or associate dean shall be made within seven calendar days and is final. The University Ombudsman is available at any stage for advice or assistance in resolving requests for accommodation. Students should understand that fairness in the examination process is an important consideration in the educational process and that they do have a duty to cooperate in making alternate arrangements.

83. ACCOMMODATION OF DISABILITIES IN THE ADMINISTRATION OF EXAMINATIONS. Washington State University is committed to providing access to education for all of its students. In addition, federal law states that academic requirements must be modified on a case-by-case basis to afford qualified students with handicaps an equal educational opportunity. The nature of certain disabilities may necessitate accommodation of these disabilities in the administration of exams. It is the policy of the university to provide reasonable accommodation consistent with the fair and secure administration of its programs.

A student with a disability who may require special accommodation should contact the Access Center (or Office of Student Services) when he or she arrives on the WSU Pullman campus. On the branch campuses a student should contact the Office of Student Services. A file documenting the disability will be established, and an accommodation form initiated. The instructor may ask for verification of a disability when a student requests an accommodation for an examination. The Office of Student Services or Access Center provides the student with a disability with an accommodation form verifying a disability and specifying the appropriate testing accommodation designed to fit the individual needs of that student. If the instructor disagrees with the arrangements as presented in the form, the instructor and/or student should seek the assistance of the Access Center (or Office of Student Services), department chair, cognizant dean or Vice Provost for Academic Affairs, in that order. The student and instructor may also contact the University Ombudsman or Office for Equal Opportunity.

88. MIDTERM GRADE SUBMITTAL. Midterm grades will be submitted for students enrolled in undergraduate courses by 5:00 p.m. on the Wednesday of the eighth week of the fall and spring semesters.

The assessment should not be interpreted as a formal grade, but rather as an indication of the student's progress to date.

Midterm grades are advisory and do not appear on the student's permanent record, the WSU transcript.

89. FINAL GRADE SUBMITTAL. Final grades will be submitted to the Registrar's Office by 5:00 p.m. on the second working day after the close of finals week. (Final grades for Summer Session will be submitted to the Registrar's Office by 5:00 p.m. on the second working day following the last day of Summer Session. Departments may be requested to submit final grades for summer courses earlier than the official submission deadline to facilitate grade reporting to students.)

GRADES AND GRADE POINTS

90. GRADES AND GRADE POINTS. Washington State University uses letter grades and the four (4) point maximum grading scale. The grade A is the highest possible grade, and grades below D are considered failing. Plus (+) or minus (-) symbols are used to indicate grades that fall above or below the letter grades, but grades of A+ and D- are not used. For purposes of calculating grade points and averages, the plus (+) is equal to .3 and minus (-) equals .7 (e.g., a grade B+ is equivalent to 3.3 and A- is 3.7). A student's work is normally rated in accordance with the following definitions:

90a. A. Student work demonstrates consistently excellent scholastic performance; thorough comprehension; ability to correlate the material with other ideas, to communicate and to deal effectively with course concepts and new material; reliability in attendance and attention to assignments.

90b. B. Student work demonstrates superior scholastic performance overall, reliability in attendance, and attention to assignments; may demonstrate excellence but be less consistent than the work of an A student.

90c. C. Student work demonstrates satisfactory performance overall, as well as reliability in attendance, and attention to assignments.

90d. D. Student work demonstrates minimal, barely passing performance overall; limited knowledge of subject matter.

90e. F. Student work demonstrates unsatisfactory performance and comprehension or unfulfilled requirements. The grade is failing.

90f. S. (Satisfactory.) Grade given upon satisfactory completion of courses numbered 499, 600, 700, 701, 702, 800, special examinations (Rule 15) and other courses duly authorized for S, F grading by the Faculty Senate. (Courses approved for S, F grading are footnoted in the Schedules of Classes.) Courses approved for S, F grading may also be graded S at midsemester indicating satisfactory progress.

A, S, or F grades only are used to report physical education activity grades.

S, M (marginally satisfactory), or F grades only are used to report grades for designated courses within the College of Veterinary Medicine.

H (honors), S, or F grades only are used to report grades for designated courses within the College of Pharmacy.

90g. P. (Passing.) A satisfactory grade for a course taken under the pass, fail Grading Option. Instructors will turn in regular letter grades for all students enrolled in courses under the pass, fail option but grades will appear on the student's permanent record as P (Passing) or F (Failure).

90h. I. (Incomplete.) An Incomplete "I" is the term used to indicate that a grade has been deferred. It is for students who for reasons beyond their control are unable to complete their work on time. All outstanding incomplete work (including grades of I, X, and blank/no grade) must be completed and posted to the official transcript prior to the conferral of the degree. It is strongly recommended that students who are granted an Incomplete limit their total number of credits to 18 credits (including credits for the Incomplete course and any new courses) during the semester when they are finishing an Incomplete.

Students have up to the end of the ensuing year to complete the course, unless a shorter interval is specified by the instructor. If the incomplete is not made up during the specified time or the student repeats the course, the I is changed to an F. (See Rule 34.) Faculty are required to submit an Incomplete Grade Report (IGR) to the departmental office with every I given. The IGR must specify conditions and requirements for completing the incomplete, as well as any time limitations less than one year.

90i. W. This is the term to be used if the student has filed, in the Registrar's Office, official notice of a withdrawal from the course prior to the end of the ninth week, or withdrew in accordance with Rule 69, or withdrew from the university in accordance with Rule 70.

90j. X. Denotes continuing progress toward completion of special problems, research, thesis, doctoral dissertation (i.e., 499, 600, 700, 701, 702, 800), or flexible enrollment courses; X grades are converted to S or to a letter grade upon completion. An X grade may also be used when no final grade is available due to instructor's illness or absence, or due to a pending administrative action outside of the instructor's control. All outstanding incomplete work (including grades of I, X, and blank/no grade) must be completed and posted to the official transcript prior to the conferral of the degree.

90k. U. (Unsatisfactory.) Student work demonstrates unsatisfactory performance, failed examination, or unfulfilled requirements in courses numbered 700, 701, 702, and 800.

90l. Z. (Failure due to discontinued attendance without withdrawal.) The Z grade is an internal grade indicating that a student earned a failing grade and discontinued all participation in a course without formally withdrawing from the course. It appears and functions as an F rather than as a Z on the transcript. An instructor entering a Z grade must enter the last date of attendance for each Z grade submitted. If the last day of attendance is not available, the date of the last exam or assignment recorded must be submitted instead.

92. **GRADE RECORDS.** Class grade records (the records from which final grades for a given class are determined) are university records which must be maintained for five years after the end of the term. Department chairs or directors are responsible for identifying appropriate storage location, which may include the instructor's campus office. Both the chair or director or their designees and the instructor shall have ready access to these records.

93. **RETENTION OF FINAL EXAMINATIONS, FINAL PROJECTS, AND FINAL PAPERS.** Final examinations, final projects, and final papers are university records which must be maintained for one year after the end of the term, unless they are returned directly to the student. Department chairs or directors are responsible for identifying appropriate storage location, which may include the instructor's campus office. Both the chair or the director or their designees and the instructor shall have ready access to these final examinations, final projects, and final papers.

98. **CORRECTION OF GRADE ERRORS.** An instructor may not change a grade after it has been filed with the Registrar, except in the case of clerical error, which the instructor may correct by so certifying to the Registrar. Such change must be approved (signature required) by the chairperson of the department in which the course was offered. Grade corrections must be processed within one year of the end of the term for which the original grade was given. In extenuating circumstances, exceptions to the one-year limit for correction of grade errors may be considered by petition to the Registrar's Office.

99. **GRADUATE STUDENT GRADES.** On a program leading to an advanced degree, graduate students must attain a minimum grade point average of 3.00 on their graduate programs and a minimum grade point average of 3.00 in all 300-400-level and graduate courses. No grade below C is accepted in any course for graduate credit.

100. THE GRADE POINT SYSTEM

A	provides 4.0 grade points per credit hour.
A-	provides 3.7 grade points per credit hour.
B+	provides 3.3 grade points per credit hour.
B	provides 3.0 grade points per credit hour.
B-	provides 2.7 grade points per credit hour.
C+	provides 2.3 grade points per credit hour.
C	provides 2.0 grade points per credit hour.
C-	provides 1.7 grade points per credit hour.
D+	provides 1.3 grade points per credit hour.
D	provides 1.0 grade points per credit hour.
F	provides no credit or grade points.
	(Credits attempted are calculated in GPA)
P	credit given—grade points not calculated.
S	credit given—grade points not calculated.
M	credit given—grade points not calculated.
H	credit given—grade points not calculated.
I	provides no credit or grade points.
W	provides no credit or grade points.
X	provides no credit or grade points.
U	provides no credit or grade points.

102. **STUDENT'S SCHOLASTIC AVERAGE.** A student's scholastic average is determined by adding the grade points earned in all WSU course work and dividing by the total number of hours in which the student has been enrolled at WSU. I, W, S, P, U, and X grades are disregarded.

103. **GROUP AVERAGES.** Group averages, honor rolls, eligibility lists for honorees, and similar lists are calculated on the basis of grades received in the Registrar's Office by 5:00 p.m. two working days following the last day of final examinations.

104. **ACADEMIC COMPLAINT PROCEDURES.** Students having complaints about instruction or grading should refer them first to the instructor. If the complaint is not resolved, then the student may refer the complaint in writing to the chairperson of the department in which the course is offered by the end of the last day of the following semester (excluding summer term). The chair's decision shall be rendered within 20 business days. After the chair's decision, the student or the instructor may appeal to the Dean's Office. Complaints must be presented in writing to the dean within 20 business days of the chair's decision. The written statement should describe the complaint, indicate how

it affects the individual or unit, and include the remedy sought from the dean. The decision of the dean is the final step and shall be made within 20 business days. At the urban campuses, the procedure is identical except that the academic area coordinator shall substitute for the department chair and the campus chancellor shall substitute for the college dean, if the department chair and/or the college dean is not located on the urban campus.

The University Ombudsman is available at any stage for advice or assistance in resolving academic complaints.

Note: Though chairs and deans (and academic area coordinators and campus chancellors) may resolve complaints about instruction and grading, they may not change a final grade without the consent of the instructor, except as provided by Rule 105.

105. ADMINISTRATIVE CHANGES TO FINAL GRADES

a.) **Chairperson Acting in Lieu of Instructor:** In the extraordinary circumstances when an instructor is not available, or has failed to respond within 20 business days according to Rule 104, then the chairperson of the department may change a final grade.

b.) **University Grade Appeals Board:** If a chair, dean, Graduate School Dean, Vice Chancellor for Academic Affairs or designee, or University Ombudsman determines that a change of a final grade is warranted for any reason other than academic dishonesty, any one of them may refer the case to the chair of the University Grade Appeals Board for review. The case must be referred within one semester of the posting of the grade (excluding summer term).

The University Grade Appeals Board shall have jurisdiction over decisions of any instructor and/or administrator on matters of University course grading appeals. The decision of the board is final and not subject to further appeal.

Note: Students may not take a grade appeal directly to the board but should follow the academic complaint procedures, as presented in Rule 104.

c.) **University Academic Integrity Hearing Board:** If an allegation of academic dishonesty is not resolved between the instructor and the student, then the case is referred to the University Academic Integrity Hearing Board. The case must be referred to the board within one semester (excluding summer term). The University Academic Integrity Hearing Board shall have jurisdiction over decisions of any instructor on matters of grading related to academic dishonesty cases. The decision of the board is final and not subject to further appeal.

GRADUATION

106. **UNDERGRADUATE APPLICATION FOR UNDERGRADUATE DEGREE.** Students may apply for their undergraduate degrees online as soon as they have completed 90 credits and are certified in the major. Advisors and the students' major department are responsible for checking that all departmental requirements are met through the advisement report / degree audit. A graduation fee must be paid at the time of application. See <http://graduations.wsu.edu/> for further information.

108. **STUDENT RESPONSIBILITY FOR GRADUATION.** The student has the ultimate responsibility for meeting all graduation requirements. The student plans the program of study each semester in consultation with the advisor. The degree requirements listed in the catalog and in the advisement report are binding. Colleges may substitute or waive college-level requirements for individual students. Departments may substitute or waive departmental requirements for individual students.

109. **PETITIONS FOR UNIVERSITY-LEVEL UNDERGRADUATE GRADUATION REQUIREMENTS.** The Provost's Office may substitute or waive university-level undergraduate graduation requirements. Students may petition to substitute or waive university-level graduation requirements by completing and submitting the University and College Requirement Petition form.

110. **UNDERGRADUATE UNIVERSITY REQUIREMENTS FOR GRADUATION.** The University requirements for graduation must be satisfied prior to the awarding of an undergraduate degree. Students meet the University requirements for graduation, including general education requirements, as follows:

a) New students are held to the University requirements that are published in the catalog with the effective date that corresponds to their Admission term.

- b) Former students who are readmitted to WSU are held to the University requirements that are published in the catalog at the time they are readmitted and reflect their most current admission term.
 - c) Students who apply to graduate who are not currently enrolled will be held to the University requirements as follows:
 - i. Students applying to graduate through Summer 2016 will be held to the General Education Requirements listed in the 2009 WSU Catalog.
 - ii. Students applying to graduate beginning Fall 2016 will be held to the University Core Requirements listed in the 2012 WSU Catalog.
- Students who were enrolled at WSU prior to Fall 2012 may petition to fulfill the University requirements based on an earlier set of requirements. All students may request to substitute their University and general education requirements for the most current set of those requirements.

111. UNDERGRADUATE MAJOR, MINOR, AND COLLEGE REQUIREMENTS FOR GRADUATION. Graduation requirements for a student's degree are set at the time the student certifies the major and include college requirements. Graduation requirements for additional majors, minors, or other academic awards are set at the time of certification for those additional academic plans. The following exceptions apply:

- a) All students after the time of certification may be required by the department to meet new major or minor requirements, provided the newer requirements neither oblige a student to enroll in more than a normal complement of credit hours in any semester nor prolong the time necessary to complete degree requirements.
- b) Current students whose certification in the major or minor is more than eight years old may be required by the department to re-certify in the major or minor in order to meet current degree requirements. This may in some cases prolong the time necessary to complete the degree.
- c) Former students who must reapply and be readmitted to WSU will be admitted as non-certified regardless of their prior certification status. These students will be eligible to recertify, on a space-available basis, when they meet the current requirements for certification set by the department.
- d) Students who apply to graduate and who have not attended WSU for six or more years will need approval from their major department to complete the degree in the major in which they were previously certified. In some cases these students may be held to more current requirements which may prolong the time necessary to complete the degree. Students may choose to seek certification in a different major without being readmitted to the university in order to earn a degree.
- e) Students shall have eight years to complete any degree, major, minor, or other academic award that has been discontinued, following the last inclusion in the WSU Catalog.

Department and program chairs have the authority to waive or provide substitute course work for major or minor requirements. Colleges have the authority to waive or provide substitutes for college requirements.

114. REQUIREMENTS FOR BACCALAUREATE DEGREES

- (a) The award of a baccalaureate degree requires the student's satisfaction of all University graduation requirements. The degree grade point average will be posted at the time that the baccalaureate degree is conferred.
- (b) The award of a baccalaureate degree requires the completion of and posting to the official transcript of all outstanding incomplete work (including grades of I, X, and no/blank grades).
- (c) The award of a baccalaureate degree and/or diploma requires the student's good standing in the university and satisfaction of all University graduation requirements. "Good standing" means the student has resolved any acts of academic or behavioral misconduct, and complied with all sanctions imposed as a result of the misconduct. The University shall have the sole authority in determining whether to withhold the degree and/or diploma in cases where the student is not in good standing due to acts of misconduct, has not resolved any acts of academic or behavior misconduct, or has not complied with all sanctions imposed as a result of misconduct. The University shall deny the award of a degree if the student is dismissed from the University based on his or her misconduct. Neither diplomas nor transcripts will be sent until students have resolved any unpaid fees and resolved any acts of academic or behavioral misconduct and complied with all sanctions imposed as a result of misconduct. (See Rule 45 and the Standards of Conduct for Students.)

- (d) To complete a baccalaureate degree, students shall:
 - 1) Earn a 2.0 cumulative grade point average or better in graded course work, in this or any institution for which a grade has been received.
 - 2) Earn a 2.0 cumulative grade point average or better in graded course work in the major.
 - 3) Complete the departmental and college requirements for an active baccalaureate degree. Baccalaureate degrees remain active for the purpose of degree completion for eight years following the last inclusion in the WSU catalog.
 - 4) Earn a minimum of 120 semester hours of credit. At least 30 must be WSU hours; see Rule 6.
 - 5) Earn a minimum of 40 semester hours of credit in 300-400-level courses; 500-level courses will count toward the 300-400-level requirement, but an undergraduate may not be required to complete a 500-level course as a requirement for the baccalaureate degree.
 - 6) Complete the University Common Requirements (UCOREs) for Graduation.
 - 7) Complete the university writing requirements, including two Writing in the Major courses and the Writing Portfolio.

115. REQUIREMENTS FOR THE PROFESSIONAL DEGREES

- (a) To earn a professional degree, students shall complete all requirements specified for the degree.
- (b) The award of a professional degree requires the completion of and posting to the official transcript of all outstanding incomplete work (including grades of I, X, and no/blank grades).
- (c) The award of a professional degree and/or diploma requires the student's good standing in the university and satisfaction of all University graduation requirements. "Good standing" means the student has resolved any acts of academic or behavioral misconduct, and complied with all sanctions imposed as a result of the misconduct. The University shall have the sole authority in determining whether to withhold the degree and/or diploma in cases where the student is not in good standing due to acts of misconduct, has not resolved any acts of academic or behavior misconduct, or has not complied with all sanctions imposed as a result of misconduct. The University shall deny the award of a degree if the student is dismissed from the University based on his or her misconduct. Neither diplomas nor transcripts will be sent until students have resolved any unpaid fees and resolved any acts of academic or behavioral misconduct and complied with all sanctions imposed as a result of misconduct. (See Rule 45 and the Standards of Conduct for Students.)

116. REQUIREMENTS FOR MASTER'S DEGREES

- (a) The Graduate School has no residency requirement.
- (b) All outstanding incomplete work (including grades of I, X, and no/blank grade) must be completed and posted to the official transcript prior to the conferral of the master's degree. Once a degree is conferred and posted to the official transcript, no changes will be allowed on the academic record that predates the degree.
- (c) The award of a master's degree and/or diploma requires the student's good standing in the university and satisfaction of all University graduation requirements. "Good standing" means the student has resolved any acts of academic or behavioral misconduct, and complied with all sanctions imposed as a result of the misconduct. The University shall have the sole authority in determining whether to withhold the degree and/or diploma in cases where the student is not in good standing due to acts of misconduct, has not resolved any acts of academic or behavior misconduct, or has not complied with all sanctions imposed as a result of misconduct. The University shall deny the award of a degree if the student is dismissed from the University based on his or her misconduct. Neither diplomas nor transcripts will be sent until students have resolved any unpaid fees and resolved any acts of academic or behavioral misconduct and complied with all sanctions imposed as a result of misconduct. (See Rule 45 and the Standards of Conduct for Students.)
- (d) To complete a master's degree, a student shall:
 - (1) Earn no fewer than 30 semester hours of credit with a minimum of 21 semester hours of course work for a thesis degree program or 26 semester hours of course work for a nonthesis degree program.

- (2) Earn a minimum grade point average of 3.00 on a graduate program in all upper-division and graduate course work completed for the master's degree.
- (3) Earn a minimum grade point average of 3.00 for all course work taken as a graduate student.
- (4) Successfully complete graduate examinations.

117. REQUIREMENTS FOR DOCTOR'S DEGREES

- (a) The Graduate School has no residency requirement.
- (b) All outstanding incomplete work (including grades of I, X, and no/blank grade) must be completed and posted to the official transcript prior to the conferral of the doctoral degree. Once a degree is conferred and posted to the official transcript, no changes will be allowed on the academic record that predates the degree.
- (c) The award of a doctoral degree and/or diploma requires the student's good standing in the university and satisfaction of all University graduation requirements. "Good standing" means the student has resolved any acts of academic or behavioral misconduct, and complied with all sanctions imposed as a result of the misconduct. The University shall have the sole authority in determining whether to withhold the degree and/or diploma in cases where the student is not in good standing due to acts of misconduct, has not resolved any acts of academic or behavior misconduct, or has not complied with all sanctions imposed as a result of misconduct. The University shall deny the award of a degree if the student is dismissed from the University based on his or her misconduct. Neither diplomas nor transcripts will be sent until students have resolved any unpaid fees and resolved any acts of academic or behavioral misconduct and complied with all sanctions imposed as a result of misconduct. (See Rule 45 and the Standards of Conduct for Students.)
- (d) To complete a doctoral degree, a student shall:
 - (1) Earn no fewer than 72 semester credit hours beyond the baccalaureate degree to include the minimum requirements as listed in the Graduate School's Policies and Procedures and as established by the academic program.
 - (2) Earn a minimum grade point average of 3.00 on a graduate program and in all 300-400-level and graduate course work completed for the doctoral degree.
 - (3) Earn a minimum grade point average of 3.00 for all course work taken as a graduate student.
 - (4) Successfully complete graduate examinations.

118. TWO OR MORE BACCALAUREATE DEGREES FROM WSU. One baccalaureate degree from WSU requires a minimum of 120 semester hours. For each additional baccalaureate degree, the student must complete an additional 30 semester hours, as well as satisfy all requirements of the college and the second degree program. For a second or subsequent baccalaureate degree, the first baccalaureate degree from WSU is understood to fulfill all University requirements for graduation, including the upper-division requirements, University Writing Portfolio, the minimum hours for the first degree (120), as well as the University Common Requirements (UCOREs).

121. SUMMER SESSION CREDITS. Credit earned during summer sessions may be applied toward the fulfillment of requirements for baccalaureate and advanced degrees in the same manner and subject to the same rules as credit earned during semesters of regular academic years.

125. DATE OF GRADUATION. Students will be recommended for their degrees at the end of the semester or term in which they complete their requirements. Diplomas will be dated the Saturday following the last day of final examination week for the fall semester, the day of commencement for the spring semester, and the Saturday following the last day of instruction for summer session.

HONORS

Honor rolls and lists are calculated on the basis of grades received by 5:00 p.m. two working days following the last day of final examinations. (See Rule 103.)

133. PRESIDENT'S HONOR ROLL. An undergraduate will be named to the President's Honor Roll under either of the following conditions:

- (a) By achieving a grade point of 3.75 while enrolled in at least 9 graded hours in a single semester at Washington State University, provided that the cumulative GPA is a 2.0 or better.
- (b) By achieving a cumulative grade point average of 3.50 based on at least 15 cumulative hours of graded work at Washington State University, provided that the semester GPA is a 3.0 or better.

137. RECOGNITION FOR SELECTED BACCALAUREATE DEGREE CANDIDATES.

Candidates for baccalaureate degrees who have completed at least 30 hours of graded work (grades in which grade points are awarded) at Washington State University will graduate summa cum laude if the cumulative grade point average for work completed at Washington State University is 3.90 or better, will graduate magna cum laude if the minimum cumulative grade point average is 3.70 but less than 3.90, and will graduate cum laude if the minimum cumulative grade point average is 3.50 but less than 3.70.

The appropriate Latin phrase will be printed on the diploma and on the final transcript. Qualified students electing to participate in the Honors College who complete its requirements satisfactorily, regardless of whether they qualify to graduate summa cum laude, magna cum laude, or cum laude, will receive a certificate of completion and a printed notation on the final transcript.

Computation of graduation honors will be done prior to the end of the final semester to allow for publication of the appropriate honors in advance of graduation. However, following the student's final semester, the Registrar will recompute the student's GPA including the last semester's work, and only this computation will determine official graduation honors.

SOLICITING

150. No agent, solicitor, or university individual or group shall be permitted to canvass or solicit faculty members during office hours in the interests of business, charity, or any other purpose not directly connected with university interest or official duties.

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