1987-89 BULLETIN

Washington State University
# Academic Calendar

## First Semester

<table>
<thead>
<tr>
<th>Event</th>
<th>1987-88</th>
<th>1988-89</th>
<th>1989-90</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration, Thursday and Friday</td>
<td>Aug 20-21</td>
<td>Aug 18-19</td>
<td>Aug 24-25</td>
</tr>
<tr>
<td>Classes begin, Monday</td>
<td>Aug 24</td>
<td>Aug 22</td>
<td>Aug 28</td>
</tr>
<tr>
<td>Labor Day—Classes will meet</td>
<td>Sept 7</td>
<td>Sept 5</td>
<td>Sept 4</td>
</tr>
<tr>
<td>Midsemester grades due in Registrar's Office</td>
<td>Oct 9</td>
<td>Oct 7</td>
<td>Oct 13</td>
</tr>
<tr>
<td>8:00 a.m., Friday</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Thanksgiving Vacation</td>
<td>Nov 23-27</td>
<td>Nov 21-25</td>
<td>Nov 20-24</td>
</tr>
<tr>
<td>Final Examinations, Saturday through Friday</td>
<td>Dec 12-18</td>
<td>Dec 10-16</td>
<td>Dec 16-22</td>
</tr>
<tr>
<td>Final grades due in Registrar's Office</td>
<td>Dec 21</td>
<td>Dec 19</td>
<td>Dec 26</td>
</tr>
<tr>
<td>8:00 a.m., Monday</td>
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## Second Semester

<table>
<thead>
<tr>
<th>Event</th>
<th>1987-88</th>
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<tbody>
<tr>
<td>Registration, Thursday and Friday</td>
<td>Jan 7-8</td>
<td>Jan 5-6</td>
<td>Jan 11-12</td>
</tr>
<tr>
<td>Classes begin, Monday</td>
<td>Jan 11</td>
<td>Jan 9</td>
<td>Jan 15</td>
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<tr>
<td>Midsemester grades due in Registrar's Office</td>
<td>Feb 26</td>
<td>Feb 24</td>
<td>Mar 2</td>
</tr>
<tr>
<td>8:00 a.m., Friday</td>
<td>Mar 14-18</td>
<td>Mar 13-17</td>
<td>Mar 19-23</td>
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<tr>
<td>Spring Vacation</td>
<td>Apr 30-May 6</td>
<td>Apr 29-May 5</td>
<td>May 5-11</td>
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<tr>
<td>Final Examinations, Saturday through Friday</td>
<td>May 7</td>
<td>May 6</td>
<td>May 12</td>
</tr>
<tr>
<td>Commencement (9:00 a.m.)</td>
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<tr>
<td>Final grades due in Registrar's Office</td>
<td>May 9</td>
<td>May 8</td>
<td>May 14</td>
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<tr>
<td>8:00 a.m., Monday</td>
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## Summer Session

<table>
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<tr>
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<th>1987-88</th>
<th>1988-89</th>
<th>1989-90</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration, Monday</td>
<td>June 13</td>
<td>June 12</td>
<td>June 11</td>
</tr>
<tr>
<td>Classes begin, Tuesday</td>
<td>June 14</td>
<td>June 13</td>
<td>June 12</td>
</tr>
<tr>
<td>Independence Day (a holiday)</td>
<td>July 4</td>
<td>July 4</td>
<td>July 4</td>
</tr>
<tr>
<td>Six-week Session ends, Friday</td>
<td>July 22</td>
<td>July 21</td>
<td>July 20</td>
</tr>
<tr>
<td>Eight-week Session ends, Friday</td>
<td>Aug 5</td>
<td>Aug 4</td>
<td>Aug 3</td>
</tr>
<tr>
<td>Final grades due in Registrar's Office</td>
<td>Aug 8</td>
<td>Aug 7</td>
<td>Aug 6</td>
</tr>
<tr>
<td>8:00 a.m., Monday</td>
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</table>
Board of Regents

Mr. Booth Gardner
Governor of the State of Washington
Advisory Member Ex Officio

Mr. Robert B. McEachern, President
Seattle

Mr. Mac Crow, Vice President
Oakesdale

Mr. R. D. Leary
Othello

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Spokane

Mr. Edwin J. McWilliams
Spokane

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Bellevue

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Spokane

Mrs. Kate B. Webster
Bainbridge Island

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Pullman

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(Appointed)
Pullman

Mrs. Gen DeVleeming, Executive Assistant
(Appointed)
Pullman

Meetings of the Board of Regents are called periodically throughout the year.

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President

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Executive Vice President and Provost

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Vice President-Business and Finance

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Vice President for University Relations

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Dean, Intercollegiate Center for Nursing Education (Spokane)

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Dean, College of Education

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Dean, College of Business and Economics

Reid C. Miller, PhD
Dean, College of Engineering and Architecture

Robert A. Nilan, PhD
Dean, College of Sciences and Arts

Division of Sciences

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Dean, College of Agriculture and Home Economics

Maureen Pastine, MLS
Director of Libraries

John C. Pierce, PhD
Acting Dean, College of Sciences and Arts
Division of Humanities and Social Sciences

Robert V. Smith, PhD
Vice Provost for Research and Dean of the Graduate School

Robert B. Wilson, PhD
Dean, College of Veterinary Medicine

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Assistant Vice President—Business

Maureen Anderson, EdD
Vice Provost for Student Affairs

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Director of Admissions

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Vice Provost for Instruction

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Vice Provost for Extended University Services

Ronald H. Hopkins, PhD
Vice Provost

William P. McDougall, EdD
Director of Summer Session

C. James Quann, EdD
Registrar and Editor, University Catalog

Ernest Renfro, BA
Assistant Vice President—Controller

Greg Royer, BA
Assistant Provost—Budget and Planning
CONTENTS

The University
Mission ................................................. 1
Degrees Granted .................................. 1
The Campus ........................................ 1
The Libraries ...................................... 1
The Summer Session ............................... 2
WSU Foundation ................................. 2

Student Life
Compton Union Building ......................... 3
Student Clubs and Honoraries ................. 3
Scholastic Societies ............................... 3
Student Government ............................ 3
Student Publications .......................... 3

Student Services and Facilities
Academic Development Program ............... 5
Career Services .................................. 5
Communications Disorders Clinic .............. 5
Counseling and Service Programs .............. 5
Disabled Student Services ..................... 5
Office of Programs for Women ................. 5
WSU Child Care Center ......................... 5
Science Supportive Services ................... 6
Student Health Service ......................... 6
Jewett Observatory and Planetarium .......... 6
Museums and Collections ....................... 6
Music and Theatre ................................ 7
Radio-TV Services ................................ 7

Educational Enhancement
Continuing Education and Public Service ... 9
Honors Program .................................. 9
International Education ....................... 9
Intensive American Language Center .......... 9
Study Abroad Programs ....................... 10

Research Facilities
Computing Service Center ....................... 11
Electron Microscopy Center .................... 11
Environmental Research Center .............. 11
International Marketing Program for
Agricultural Commodities and Trade Center .. 11
Institute for Basic and Applied Energy Research .. 11
Laboratory for Atmospheric Research ........ 11
Nuclear Radiation Center ..................... 11
Social and Economic Sciences Center ........ 12

Admission and Financial Aid ................... 13

Housing .............................................. 17

Tuition and Fees ................................ 19

Academic Regulations .......................... 21

Colleges, Graduate School, Intercollegiate
Center for Nursing Education, Off Campus Centers .. 27

Academic Departments, Courses, and Curricula .. 37

Faculty ............................................... 167

Index ............................................. 201
Accreditation and Associations

Washington State University is accredited by the Commission on Colleges of the Northwest Association of Schools and Colleges, the regional accrediting association. The institution is a member of the National University Continuing Education Association and is listed in the official publications of the U.S. Office of Education and the State Department of Public Instruction.

Many departments and colleges are accredited by professional accrediting associations recognized by the Council on Postsecondary Accreditation. This information is included in the introductory material of the various departments and colleges, and an abbreviated list is printed in the front of this catalog.

Commission on Colleges of the Northwest Association of Schools and Colleges
Council of Graduate Schools in the United States
American Assembly of Collegiate Schools of Business
American Association for Accreditation of Laboratory Animal Care
American Association of Colleges for Teacher Education
American Association of Colleges of Pharmacy
American Association of Veterinary Laboratory Diagnosticians
American Camping Association
American Chemical Society
American Council for Construction Education
American Council on Pharmaceutical Education
American Dietetic Association
American Education Research Association
American Psychological Association
American Society of Agricultural Engineers
American Society of Landscape Architects
American Speech-Language-Hearing Association
American Veterinary Medical Association
Computer Science Network
Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology
Foundation for Interior Design Education Research
National Architectural Accrediting Board
National Association of Schools of Music
National Athletic Trainers Association
National Council for Accreditation of Teacher Education
National League for Nursing
National University Continuing Education Association
Society for Range Management
Society of American Foresters
State Board of Education
United States Department of Education
University Council on Education Administration
Washington State Board of Nursing
Washington State University

Washington State University is the land-grant university of the state of Washington. It is located in one of the world’s richest agricultural regions—the Palouse country of southeast Washington—where some of the nation’s finest wheat and other grain crops are produced annually. Washington State University is dedicated to the preparation of students for productive professional careers, to basic and applied research in a variety of areas, and to the dissemination of knowledge to the general community. The university consists of seven colleges, a graduate school, an Intercollegiate Center for Nursing Education in Spokane, the Center for Hotel and Restaurant Administration in Seattle, and the southwest Washington Joint Center for Education in Vancouver. Undergraduate and graduate programs are also offered through the Tri-Cities University Center in Richland, Washington.

Washington State University offers strong and diversified programs of instruction. From its founding in 1890, liberal arts and sciences have occupied an important place in the curriculum along with business, education, nursing, pharmacy, and the traditional land-grant programs in agriculture, home economics, veterinary medicine, and engineering. WSU now offers more than 100 major fields of study to undergraduate students. The bachelor’s degree is available in all major areas, and the master and doctoral degrees are available in most subject areas. This catalog contains a complete list of departmental requirements and degrees awarded. The faculty is interested in the development of instructional methods that work open students’ minds to the most recent knowledge and discoveries. The WSU Honors Program in one of the few all university programs for superior students at a major American institution of higher learning. In recent years, programs in environmental science, Asian/Pacific American studies, Black studies, Chicano studies, international business, Native American studies, speech pathology, and women studies have been added to the curriculum. Doctoral programs in business administration, chemical, civil and environmental, electrical, computer, and chemical engineering were initiated in 1984.

Washington State University is one of the largest residential universities west of the Mississippi. Of the student body, approximately 14,000 undergraduates and 2,000 graduate students, about half live on campus in university housing or in fraternities or sororities. Here, students of diverse social, economic, and ethnic backgrounds from throughout the nation and more than 80 foreign lands come together in a community in which education is the principal industry and human development the primary concern. The heart of student life is the educational, cultural, and social programs of the university; the opportunity for students to know and work closely with their instructors is one of the advantages of a residential campus. The pattern of residence living and the natural setting of the university combine to produce a community dedicated to student educational and social growth. The faculty includes a substantial number of scholars with noteworthy reputations in their areas of specialization.

The Campus

Washington State University is located at Pullman in the southeastern part of the state. Modern classroom buildings, special research and instructional equipment, student living accommodations, libraries, hospital facilities, auditoriums, gymnasiums, and administrative offices are located in the central part of the campus for easy access by students and visitors. In addition to the main campus, the university maintains thousands of acres of farmland and agricultural research centers at various locations throughout the state.

In the past few years, a number of important buildings have been constructed on the campus. These include a performing arts center with a seating capacity of over 12,000—the largest unit of its kind on any university campus in the Pacific Northwest, a biological sciences building, a science and engineering library, a computer science building and a computing center, a communications building, a fine arts building including galleries, an electrical-engineering building, and a multi-story physical sciences building. The stadium has been expanded, and new track and field and baseball facilities were recently completed.

A nine-hole golf course, 16 all-weather tennis courts, and several swimming pools, including one of Olympic dimensions, are located on the campus. In addition, special playing fields afford an opportunity for fall and spring outdoor intramural competition in a variety of sports. WSU has one of the largest university-sponsored intramural programs in the nation, and the nearby hills and streams provide ample opportunity for individual activities such as skiing, hiking, fishing, picnicking, and camping.

Degrees Granted

Academic Degrees

<table>
<thead>
<tr>
<th>Degree</th>
<th>Field</th>
<th>Code</th>
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<tbody>
<tr>
<td>Accounting, M Acc</td>
<td>Business Administration, MA</td>
<td>01.04.01</td>
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<tr>
<td>Adult and Continuing Education, MACEd</td>
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<tr>
<td>Agribusiness, BS</td>
<td>Agricultural Economics, BS, MA, PhD</td>
<td>01.01.02, 01.01.03</td>
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<tr>
<td>Agricultural Engineering, BS</td>
<td>Agricultural Mechanization, BS</td>
<td>01.01.01</td>
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<tr>
<td>Agriculture, BS</td>
<td>Agronomy, BS, MS, PhD</td>
<td>02.01.01, 02.01.02</td>
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<td>American Studies, BA, MA, PhD</td>
<td>Animal Sciences, BS, MS, PhD</td>
<td>02.01.01, 02.01.02</td>
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<td>Anthropology, BA, MA, PhD</td>
<td>Architectural Studies, BA</td>
<td>03.01.01, 03.01.02</td>
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<tr>
<td>Architecture, B Arch, MS</td>
<td>Asian Studies, BA</td>
<td>03.01.01, 03.01.02</td>
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<tr>
<td>Biochemistry, BS, MS, PhD</td>
<td>Biology, BS, MS</td>
<td>04.01.01, 04.01.02</td>
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<tr>
<td>Black Studies, BA</td>
<td>Botany, MS, PhD</td>
<td>04.01.01, 04.01.02</td>
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<tr>
<td>Business Administration, BA, MBA, PhD</td>
<td>Chemical Engineering, BS, MS, PhD</td>
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<td>Chemical Physics, BS, MS, PhD</td>
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<td>Chico State, BA</td>
<td>Child and Family Studies, BA, MA</td>
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<td>Civil Engineering, BS, MS, PhD</td>
<td>Clothing and Textiles, BA</td>
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<td>Communications, BA, MA</td>
<td>Computer Science, BS, MS, PhD</td>
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<td>Construction Management, BS</td>
<td>Criminal Justice, BA, MA</td>
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<td>Economics, BA, MA, PhD</td>
<td>Education, BA, EdM, MA, EdD, PhD</td>
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<td>Electrical and Computer Engineering, PhD</td>
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<td>Engineering Management, MS</td>
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<tr>
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<td>Entomology, BS, MS, PhD</td>
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<td>Environmental Engineering, BS, MS</td>
<td>Environmental Science, BS, MS</td>
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<tr>
<td>Fine Arts, BA, MFA</td>
<td>Food Science and Technology, BS</td>
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<td>Foreign Languages and Literatures, BA, MA</td>
<td>Food Science, MS, PhD</td>
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<td>Forest and Range Management, MS</td>
<td>Geosciences, BS, MS, PhD</td>
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<td>History, BA, MA, PhD</td>
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<td>Horticulture, BS, MS, PhD</td>
<td>Interior Design, BA</td>
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<td>Human Sciences, BA, MS</td>
<td>Landscape Architecture, BS</td>
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<tr>
<td>Music, BA, B Mus</td>
<td>Liberal Arts, B Lib A</td>
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<tr>
<td>Music, BA</td>
<td>Materials Science and Engineering, BS, MS, PhD</td>
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<td>Mechanical Engineering, BS, MS, PhD</td>
<td>Microbiology, BS, MS, PhD</td>
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<tr>
<td>Mechanical Engineering, BS</td>
<td>Music, BA, B Mus, MA</td>
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<tr>
<td>Music, BA</td>
<td>Nutrition, BS, MS, PhD</td>
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<tr>
<td>Nursing, BS, M Nurs</td>
<td>Pharmacology and Toxicology, MS, PhD</td>
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<td>Pharmacology, B Pharm</td>
<td>Philosophy, BA, MS, MS</td>
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<td>Physical Education, BS, MS, PhD</td>
<td>PhD</td>
<td>05.01.01, 05.01.02</td>
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<td>Range Management, BS, MS</td>
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<td>Soils, BS, MS, PhD</td>
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<td>Veterinary Science, BS, MS, PhD</td>
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<td>Vocational Technical Education, BS</td>
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<td>Wildlife and Wildland Recreation Management, BS</td>
<td>Wildlife Biology, BS, MS</td>
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<td>Zoozoology, PhD</td>
<td>Provisional (for teaching)</td>
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</table>

The Libraries

The University Libraries are an integral part of the educational facilities. Books, journals, newspapers, microfilms, technical reports, maps, manuscripts, art prints, and photographs form resources of more than three
million items supporting commitments in teaching, research, and public
service. The libraries are depositories for U.S. documents, municipal and
state documents, those from foreign countries, as well as publications of
the U.N.

Reference librarians provide personal assistance using modern methods
of information retrieval. For the most part, collections are maintained in
easily accessible, open stack arrangements. Quiet study areas are available,
as are a limited number of carrels for graduate students and others en-
gaged in research. Special service programs include instruction in library
use accessing national computerized information systems; and accessing
resources of other libraries, national and international, through inter-library
cooperation.

Holland Library provides strong collections in the social sciences and
the humanities, as well as sophisticated service components designed to
assist students, faculty, and researchers in utilizing these resources.
Manuscripts, Archives, and Special Collections contain rich collections of
primary resource materials—books, manuscripts, photographs—to sup-
port study and research in a number of fields, including Pacific Northwest
history, modern British literature, regional publishing, veterinary history,
agricultural history, wildlife and outdoor recreation, WSU history, and
other subjects. Instructional Media Services provides a comprehensive col-
collection of materials, equipment, and services to obtain, design, produce,
and display audiovisual materials. IMS provides media, projection video,
and sound reinforcement facilities in university classrooms, lecture halls,
and auditoriums.

Owen Science and Engineering Library, whose collections support study
and research in the pure and applied sciences, is the largest and most
technologically advanced facility in the Pacific Northwest. Its campus loca-
tion places it convenient to most departments served by its collections.

The collections of the George W. Fischer Agricultural Sciences Branch
Library in Johnson Hall Annex emphasize support for the plant and en-
tomological sciences.

The Veterinary Medical/Pharmacy Library, located in Wegner Hall,
serves the research and instructional needs of the Colleges of Veterinary
Medicine and Pharmacy.

The George B. Brain Education Library in Cleveland Hall, offers a wide
range of materials and services to meet research and instructional needs
from preschool through community college and adult education.

The Summer Session
Washington State University conducts an eight-week Summer Session for
graduate, undergraduate, and visiting students as an integral part of its
year-round operation. Credit earned during summer sessions may be ap-
plied toward fulfillment of requirements for baccalaureate and advanced
degrees in the same manner and subject to the same rules as credit earned
during semesters or regular academic years.

During the Summer Session, courses are offered in most university
departments to meet the needs of new freshmen and transfer students who
wish to get an early start on their degree programs. Courses in a variety
of academic areas are offered for continuing undergraduate and graduate
students as well as for others qualified to pursue them to advantage. Em-
phasis is also placed on a program of advanced work for teachers and school
administrators.

Shorter sessions including early and pre-session courses varying from
one to six weeks, special conferences, and institutes are also features of
the Summer Session.

The Summer Session Bulletin, published annually in February is
available upon request to the Registrar, Washington State University. Ap-
plication forms for both enrollment packs and housing with published
deadline dates are included in the Summer Bulletin.

WSU Foundation
The WSU Foundation was formed in 1979 as the official fundraising arm
of Washington State University to encourage and administer private gifts
in support of excellence at WSU. The primary function of the foundation
is to develop effective, forward-looking development programs that generate
much-needed private support from alumni, corporations, foundations, and
other friends of the university. The foundation administers donations in
a business-like manner and in the best interests of both the donor and the
university. Inquiries may be addressed to the President, WSU Foundation,
Pullman, WA 99164-1042
Student Life

Compton Union Building

The Compton Union Building is the campus community center. More than a building, it is an educational program of out-of-class activities designed to provide for the student's personal, social, and cultural development; practice in leadership; and management and enjoyment of leisure activities.

The Union has facilities for student activities, conferences and conventions. Facilities include food services of all kinds, meeting rooms, a games area, crafts area, guest rooms for campus visitors, movie theater, copy center, satellite video center, lecture notes, outdoor rental shop, art gallery, legal services, lockers, and a variety of shops (called "Little Main Street") offering a U.S. Post Office, barber shop, bank, gift shop, travel service, credit union, floral shop, dry cleaning service, film processing service, and bank exchange machine.

Other groups with office space include Associated Women Students, Residence Hall Association, Panhellenic/Intrafraternity Council, Young Men's Christian Association, Women's Center, and Sex Resource Center.

Student Clubs, Organizations, and Honorary

Participation in departmental clubs and honorary service organizations, and campus activities is an important part of student life. More than three-fourths of the student body take part in the activities program. Adequate opportunities are available for every student to pursue extracurricular interests through service, recreation, religious, and other specialized interest groups.

ASWSU and the Activities/Recreation office coordinate and guide existing student organizations and assist new groups in developing sound programs. A professionally trained staff is prepared to help all students in planning well-balanced activity programs adapted to their particular needs and interests.

Scholastic Societies

Phi Beta Kappa. Phi Beta Kappa, the oldest national honorary fraternity in the United States, was established to promote scholarship and friendship among students and graduates of American colleges and universities. The WSU chapter of Phi Beta Kappa, established in 1928, was one of the first chapters established at a land-grant university. To be considered for selection, students must be majoring in a liberal arts discipline, have 75 percent of their course work in liberal arts, and have earned at least 45 of their total credits from WSU with a minimum 3.45 g.p.a. Only about 15 percent of the institutions of higher education in the United States have programs sufficiently strong in the sciences and liberal arts to warrant membership. Seventy-seven (77) WSU students were inducted last spring.

Phi Kappa Phi. Phi Kappa Phi, the first national scholastic society to recognize superior scholarship in all fields of study, was established in 1897. The WSU chapter was founded in 1919. Students from all disciplines within the university are eligible for membership. Candidates are selected from the upper 10 percent of the senior class and the top 5 percent of the junior class each year. Graduate students are also eligible for membership. Three hundred forty-eight (348) undergraduates and 40 graduate students were inducted last year.

Student Government

Undergraduate students at Washington State University are represented by 18 elected representatives who serve on the Associated Students of Washington State University (ASWSU) Senate. ASWSU is interested in a wide range of issues relating to the student's life at WSU and is led by the student body president and vice president. The senate is directly involved in the allocation of ASWSU funds for programming and the establishment of operating procedures. Through the senate, ASWSU has developed a number of student committees and programs in the areas of education, entertainment, and recreation.

Graduate and professional students are members of the Graduate and Professional Students Association (GPSA). Five members of the GPSA represent their constituents on the Faculty Senate.

Student Publications

Student publications provide opportunities for students to express themselves, to serve the university community, and to gain experience in the production of a variety of printed self-supporting publications. The goal of each student publication is to provide information for students, staff, faculty, alumni, and other readers interested in Washington State University.

The Daily Evergreen is issued five times per week on campus during the nine months of the regular academic year. The Summer Evergreen is issued weekly during the eight-week summer session.

The Chinook is the university yearbook issued each August to over 9,000 buyers.
Student Services and Facilities

Academic Development Program

The Academic Development Program provides educational opportunities and retention services for students throughout the university. Specifically, the program offers academic advising and counseling, some diagnostic testing, individual and group instruction, assistance to students with special learning needs, and basic computer skills labs. Instruction in reading, writing, science, math, and study and test-taking skills is available. Tutorial assistance in most General University Requirement courses is provided without charge to participating students. For those who wish to arrange for private tutoring, a roster of qualified tutors in a number of subject areas is available from the ADP.

Students may be assigned an adviser in the Academic Development Program upon entrance to the university or as a retention condition. Students may also be referred to the ADP at any time by faculty members, counselors, and others for any of the services it provides. The ADP staff is available daily in the Administration Annex, Room 101, (509) 335-9602.

Career Services

Career Services is a student service. Three goals have been identified which are aimed at assisting students during their residence at Washington State University: (1) to aid students in defining career goals and aspirations while presenting them with future viable employment opportunities, (2) to assist students in seeking employment on a path to success, and (3) to bring together qualified applicants and prospective employers in a mutually-satisfying manner. In order to accomplish these goals, Career Services has developed many programs/services which benefit all students.

The Professional Experience Program (PEP) is a cooperative education effort uniting the student, the employer, and the academic department. Two purposes of this program are to help the student learn by using work experience as a supplement to textbooks, and to apply what has been learned in the classroom. With hundreds of internship opportunities generated every year in areas such as engineering, business, computer science, and the humanities, opportunities are endless in gaining work experience in the major field while earning college credit. Students may often find that upon graduation, an internship experience gives them that edge for employment in the career of their choice by subsequently leading to earlier promotions in that career. PEP will help students find an internship related to their major. The four-year-old program has already placed over 1,000 students in internships that have proven to be invaluable experiences. To participate in PEP, drop by Career Services, located in the Administration Annex Building across from Todd Hall.

Communication Disorders Clinic

The Communication Disorders Clinic helps students to correct communication disorders involving effective articulation (such as lisping and defective sound production), stuttering, voice disorders (hoarseness, hoarseness, nasality, abnormal pitch, and speech and language problems resulting from brain injury or neuromuscular disability). The clinic tests hearing and provides hearing-aid evaluations, speech, language, lipreading, and auditory training for persons with hearing disabilities. Students with specific learning disabilities may also receive special help at the clinic. Application should be made to the Communication Disorders Clinic of the Department of Speech immediately after registration. There is no charge to students.

Counseling and Service Programs

WSU Counseling Services, located on the third floor of the Administration Annex Building, offers specialized individual and group counseling and testing services without charge to any regularly enrolled student. A staff of professionally trained counselors is available to provide confidential assistance on an individual basis to students with educational, vocational, personal, social or marital concerns. Group counseling and group workshops are provided to help students develop specific adjustment skills in areas such as stress reduction, assertiveness training, and other areas of personal development. Crisis services and consultation are also available on a 24 hour basis.

Counseling Services provides the university with a comprehensive testing program. National, state, and personal testing is available by appointment. In cooperation with Career Services an up-to-date resource facility containing many occupational materials is maintained in the building for student use.

The Asian American Student Counseling Office provides services in all areas of advising including college adjustments, choosing majors, financial problems, homesickness and all kinds of academic and personal issues that are relevant to students. It is also a contact point for all Asian American students to socialize with each other. The office attempts to emphasize the need of an ethnic identity and of a bicultural lifestyle. The Counseling Office for Black Students provides programs and services designed to address the cultural, social, academic, and personal needs and concerns of the university's Black students. Students are assisted with academic problems, financial aid, tutorial services, housing, work-study employment, and social and cultural adjustment to campus life and other concerns.

Major services offered by the Chicano Student Counseling Office include academic advising, career and educational counseling, liaison with university offices and outside agencies, scholarship information, assistance in seeking and obtaining employment and general information and referral services. The office recognizes the diversity of Chicano students, and seeks to assist them in realizing personal, academic, and career goals.

The Native American Student Counseling Office provides students with individual and group counseling, advisory services, academic assistance, and assistance with financial aid, housing and food services, and relations with Tribal and Bureau of Indian Affairs offices.

Disabled Student Services

The Disabled Student Services (DSS) Program plans for and coordinates services for students with physical disabilities, permanent health problems, and learning disabilities.

DSS works with the entire campus community to increase accessibility and sensitivity to the needs of disabled students, particularly regarding classroom accommodation, financial aid, and housing. The program includes direct and referral services for students.

Services include guaranteed course selection, modified test-taking accommodations, text-taping, and accessible van transportation for on-campus activities for mobility limited students.

Services include assistance with obtaining tutors and volunteer note takers, assistance with campus orientation and mobility training, and the loan of specialized equipment.

For additional information on the availability of these services, contact the DSS Office, 461 Holland Library, (509)335-1565.

Office of Programs for Women

The Office of Programs for Women (OPW), located in Holland Library 461, coordinates programming of issues relevant to women, acts in an advocacy role for women within the university, and provides services and resources to meet the special needs of all women. The Role Model Resource Bank and Re-entry Advisory Program are sponsored by this office.

The Women's Center, located in the Compton Union Building B-27, is a component of OPW and provides a place where students, staff, faculty, and community people can gather in a non-sexist environment to exchange ideas and information. Programs include a noon brown-bag series on such topics as career choices for women, women's health, family relationships, and current issues of concern to women.

The Re-entry Advisory Program (RAP), located in Holland Library 461 (335-6816), has been organized in response to needs expressed by mature students returning to school after an extended lapse in their education. The purpose of RAP is to provide assistance, information, support, and advocacy for re-entry students. Some of the areas for information and referral are admissions, registration, career advising, study skills, and adjustment to academic life.

WSU Child Care Center

The WSU Child Care Center, located in Commons Hall 103, offers part- or full-time child care for 2- to 10-year-old children of WSU students. Licens ed by the Washington Department of Social and Health Services, the center is designed to meet child care needs of student parents while providing intellectual, social, emotional, and physical growth opportunities for children. Activities vary from quiet to active, group to individual,
structured to unstructured. Children are grouped developmentally by age. Snacks and lunches are provided.

The center is also available to students for observation and participation for classes. Visitors are encouraged to observe the center program at 103 Commons Hall. Further information may be obtained by calling (509) 335-8847.

Science Supportive Services

Science Supportive Services (SSS) is an academic advisory program designed to assist students from academically and economically disadvantaged backgrounds who are interested in science careers. The program serves two broad areas—health sciences and general science. The health science component prepares students to enter the spectrum of health-care-related professions and professional schools. The general science component serves students who are interested in such disciplines as agriculture, forestry, engineering, architecture, computer science, and other science disciplines. Outstanding features of the SSS are academic planning and counseling, tutorial services, summer and permanent placement, lecture notes, recommendations for professional schools, and special seminars and lectures. SSS is located in Van Doren Hall 4.

Student Health Service

The Student Health Service is located in the same building as Pullman Memorial Hospital on the southern periphery of the campus. All students who pay full university fees are eligible for care at the Student Health Service; the mandatory student health fee is charged at the time of registration. In addition, nominal charges may be made for supplies used in caring for patients.

A Personal Medical History Form is to be completed by the student and returned to the Student Health Service prior to initial registration. The completion of this form does not necessitate a visit to your physician or a physical examination. Documentation of adequate measles immune status is a requirement for enrollment at WSU.

Appointments for clinic visits may be made by telephone, 335-3575, or in person between 8:00 a.m. and 5:00 p.m., Monday through Friday. In addition, the clinic is open for “sick calls” only from 9:00 a.m. to 12:00 noon, Saturdays. Emergencies will be seen any time. There is a fee charged to patients coming in outside of regular clinic hours.

Students enrolled in seven or more credit hours can also purchase a supplemental hospital-accident plan at a very reasonable cost.

Jewett Observatory and University Planetarium

The James Richard Jewett Observatory is the gift of Mr. and Mrs. George F. Jewett of Spokane and is named in honor of Mr. Jewett’s father, a former professor of ancient languages at Harvard University. The observatory houses a twelve-inch refractor with a visual lens and a twenty-five-foot revolving dome.

The University Planetarium is located in Sloan Hall 231. Information about open house and group tours of either the observatory or the planetarium can be obtained by contacting the Program in Astronomy.

Museums

Conner Museum
The Charles R. Conner Museum, located in Science Hall, exhibits fishes, amphibians, reptiles, and several hundred mounted birds and mammals, including deer, antelope, mountain sheep, mountain goat, cougar, and small species. The museum will be closed for remodeling until summer 1989.

James Entomological Collection
One of the largest insect collections in the Pacific Northwest, the Maurice T. James Collection houses over one million insect specimens and an extensive working library. Adults and immature stages of all insect groups and many related arthropods are represented with particular strengths in the flies, beetles, and butterflies. Primarily of regional significance, the collection also includes considerable material from the New World tropics, eastern North America, and Europe. The collection functions essentially as a research facility by providing specimens on loan to recognized scientists worldwide, by offering identification services to university extension entomologists, and by serving as a repository of type specimens and other materials. Public tours and interpretive presentations for groups can be arranged in advance by calling 335-3394. The collection room is located at the west end of Johnson Hall on the third floor.

Myological Herbarium
The Myological Herbarium of Washington State University is housed in, and maintained by, the Department of Plant Pathology, third floor, Johnson Hall. The herbarium was founded by Frederick D. Heald, the first chairman of the department, in 1915 and now contains more than 65,000 specimens of fungi. Included are representative materials of all the major groups from the slime molds and true molds to the larger, fleshy mushrooms. The parasitic fungi of northwestern North America have been emphasized; however, through exchange and purchase, representative materials of all groups from all over the world have been incorporated. Loans are freely available to individuals associated with recognized botanical institutions anywhere in the world. Specialists wishing to utilize the facilities of the Myological Herbarium are welcome, and are asked only to inform the Department of Plant Pathology (509) 335-8541 of their desire(s) to use the facilities.

Owabey Herbarium
The Marion Owabey Herbarium is an internationally recognized resource for research, teaching, and service. Located in Heald G-9, the herbarium houses 300,000 plant specimens, primarily from the Pacific Northwest but including worldwide collections. In addition to native vascular plants and weeds, the herbarium contains mosses, liverworts, lichens, and special collections of seeds and cultivated plants. The herbarium is open from 8:00 a.m. to 5:00 p.m. five days a week and by appointment; staff provide assistance to persons wanting to identify and learn about plants. Facilities include a small reference library, reprint and slide collections, computers, and special botanical indices.

Culver Display and Collection
The Culver Display, located in the Physical Sciences Building, houses the Jacklin Petrified Wood Collection. This spectacular collection contains more than 2,000 cut and polished specimens of petrified wood from all major localities in the western U.S. It is the largest display of its kind in the western U.S. Also included in the collection is a large selection of cut and polished agates, geodes and dinosaur bone.

The Culver Collection includes over 100 classic rock and mineral specimens from localities throughout the world. Both the Jacklin and Culver Collections may be viewed Monday through Friday, 8:00 a.m. to 5:00 p.m. Group tours may be arranged for weekend days by calling the Department of Geology.

Smith Soil Monolith Collection
The Henry W. Smith Soil Monolith Collection contains more than one hundred and fifty preserved soil profiles, some as much as eight feet in length, representing soils from all of the geographic regions in the state of Washington and eight of the ten soil Orders in Soil Taxonomy. Soils that are particularly well represented in the collection are those of the Palouse region and those from eastern and central Washington that contain layers of volcanic ash from the many prehistoric and historic eruptions of volcanoes in the Cascade Region. The collection is the work of Dr. Henry W. Smith, emeritus professor of soils at Washington State University. The soil monoliths constitute a very valuable resource for both teaching and research within the Department of Agronomy and Soils. The collection is located in Johnson Hall 114 and may be viewed from an observation window any time the building is open. Persons or groups interested in touring the collection should contact Dr. Alan Busaca at 335-1859.

The Museum of Art
The Museum of Art was established in 1974 around a core collection of American paintings assembled by former President E. O. Holland and former WSU Regent Charles Orion. Dedicated to serving the educational purposes of WSU and the people of the state of Washington, the museum operates a program which embraces a wide variety of exhibitions ranging from antiquity to the contemporary, from design and photography to sculpture and painting, by regionally and nationally known artists. Many of the exhibits originated by the museum staff have toured the nation. The museum offers a wide variety of speakers and films, and special music and dance programs throughout the year.

The museum’s collection of American 19th and 20th century paintings, drawings, and prints has grown in the past years through financial donations and important gifts from collectors and alumni in the Northwest. In 1975, the Museum of Art was a founding member of the Washington Art Consortium, a then unique venture by four small museums to build
a major national collection of works on paper by American artists. The
museum's consortium activities have provided an added focus to its own
collecting of additional works on paper from all eras represented in its
collection.

The museum documents its major exhibitions with published catalogues,
available in the museum's bookshop. The exhibition galleries of the Museum
of Art are open and free to the public six days a week during the fall and
spring semesters.

Drucker Collection
The Minnie Barstow Drucker Memorial Collection of Oriental Art is housed
in White Hall. The Drucker Collection consists of Oriental furniture, ac-
cessories, art, textiles, and costumes. The collection was given to the uni-
sity in 1944 by the late Arthur Eilert Drucker in memory of his wife. The
Chinese, Korean, and Japanese artifacts were collected during the years
the Druckers made the Orient their home. The collection may be viewed
in White Hall by writing directly to the Department of Clothing, Interior
Design, and Textiles or by calling 335-3823 for an appointment.

Music and Theatre
The Music Department presents a varied program of concerts, recitals,
workshops, and master classes each year. These presentations given by facul-
ty, students, and visiting artists are listed in a monthly calendar of events
which is available from the Kimbrough Music Office on request.

The university supports several performance organizations with enrollment
open to the general university student by audition. Students interested in con-
inuing their musical experience through participation in one of the
ensembles are encouraged to contact the Music Office for further
information.

The University Theatre presents a widely varied year-round program
offering many opportunities for participation: eight productions in Duggy
Hall theatres, a seven-week summer repertory season, theatre for children
and young people, and many experimental and student-directed produc-
tions. Interested students should contact the Director of University Theatre
for information regarding any aspect of the program performance, tech-
tical, or management. Auditions are open to all members of the univer-
sity community.

Radio-Television Services
Radio-Television Services operate four radio stations, one television sta-
tion, and WSU Instructional Telecommunications.

KWSU-AM, a member of National Public Radio (NPR), is one of the
nation's pioneer public radio stations, having begun broadcasting in 1922.
KFAX-FM, Tri-Cities, also an NPR member, signed on July 1, 1982, and
KRFA-FM serving the Palouse region signed on August 1, 1984. Together,
the three NPR radio stations and eight associated translator stations reach
some 800,000 potential listeners in the Inland Northwest.

KUGR is a student-operated cable radio station. KWSU-TV, a member
of the Public Broadcasting Service (PBS), produces and broadcasts local
and national programs. The instructional support operation produces
materials for academic departments, provides on-campus instructional sup-
port, and operates the Washington Higher Education Telecommunication
System, a statewide microwave network. Students are used extensively on
the working staff in the operation.
Educational Enhancement

Continuing Education and Public Service

Continuing Education and Public Service (CEPS) is responsible for extending the educational resources of the university to people throughout the state of Washington. Through its divisions, CEPS works in cooperation with the university departments, off-campus centers, and other institutions to meet the educational needs of individuals and communities by developing and delivering courses, programs, and technical assistance.

The Division of Graduate and Professional Programs sponsors off-campus credit courses and programs including independent study. Through the division WSU offers off-campus graduate and undergraduate courses in areas such as agriculture, education, business, engineering, computer science and health sciences. Degree programs are available at WSU-Spokane, the Southwest Washington Joint Center for Education in Vancouver and at other locations throughout the state. Many courses in these programs are delivered via the Washington Higher Education Telecommunication System, a two-way audio-video interactive microwave system which brings WSU classes to specified sites in the state. The Independent Study Program allows independent and highly motivated individuals to work at their own pace through courses by correspondence. Up to 25 percent of the credits for a baccalaureate degree may be taken from WSU by correspondence. The division also administers internships for the Departments of Speech, Communications, Education, and the Professional Experience Program.

The Division of Conferences and Institutes plans and conducts conferences, institutes, seminars, short courses, and workshops in Pullman and various locations throughout the state. Offices are located in Pullman, Puyallup, Spokane, and Vancouver. The division draws upon the instructional resources of the university and outside content experts to meet a diversity of continuing education, professional and training needs. Clients include business and industrial firms, schools, professional associations, and other interest groups who seek to increase their knowledge and professional competencies. For more information about programs and services provided by conferences and institutes, call (509) 335-2946.

The Office of Community Service is a clearing house to match community service requests with faculty expertise and institutional resources. The Office of Community Service coordinates the Partnership for Rural Improvement network, a statewide consortium of universities, community colleges, and governmental and public agencies dedicated to the improvement of the quality of living. The office assists with community and organizational development, program and project planning consultation, group and process facilitation, and training on a variety of subjects such as group dynamics, citizen participation, program evaluation, and leadership development. The Office of Community Service is also the state center for Community Education Development. Community education programs in over 150 school districts provide programs ranging from personal development to certification and advanced training. For more information about community services call (509) 335-5509.

University Honors Program

The Honors Program at Washington State University provides a broad and comprehensive intellectual experience. In addition to intensive specialization in their chosen field of study, those enrolling in the program acquire an appreciative understanding of the natural and social sciences, the arts, of language and literature, and of the historical and philosophical development of the cultures of the world. The aim of the program is to promote genuine intellectual curiosity which will abide long after the student has graduated.

Approximately 600 students are enrolled in the Honors Program at Washington State. They are from all departments and colleges of the university, from agriculture and from zoology, from engineering and from English, from fine arts and from economics. In every case the student is pursuing work in a major department in preparation for a professional career. Concurrently, the students enrolled in the program are required to take courses in the Honors curriculum.

Honors courses often correspond to the usual undergraduate courses but with important differences. The Honors Program is not an accelerated program; it tends to enrich rather than to accelerate the learning process. Most Honors classes are small, and students establish a close intellectual relationship with their instructors.

Admission to the Honors Program

Each year approximately 10 percent of the entering freshman class is invited to join the Honors Program. Freshmen are selected on the basis of high school grade point average, scores from college and pre-college testing programs, and information obtained from the student and high school advisors. Eligible students will receive letters inviting them to consider the Honors Program during the spring or summer preceding their freshman year. Those who do not receive such letters but are anxious to investigate the possibility of participating in the program should contact the Honors Center, Washington State University, for information.

The eligibility of transfer and foreign students is judged in each individual case on the basis of the student's knowledge and competence in the work which has been done elsewhere. Such students ordinarily are not considered for admission to the Honors Program after the beginning of their junior year.

Students who are not admitted in the initial selection may petition to enter the Honors Program at any time after the end of their first semester but not later than the end of their sophomore year. To continue participation in the Honors Program a student must maintain an overall B average (3.00) and must maintain the same average in Honors work. Students in the Honors Program are not required to complete the General University Requirements for Graduation.

International Education

The Office of International Education administers and coordinates international programs undertaken by the university to strengthen its role in international affairs. Its functions may generally be described as follows: administering participant training for overseas projects; administering student educational exchanges between Washington State University and foreign universities; acting as a clearinghouse for interested WSU staff and students on matters relating to study and teaching abroad, including Fulbright awards; handling all foreign student affairs and all immigration matters that relate to foreign students and faculty. Through the Sponsored Student Program, the office guarantees and administers funds for students on approved scholarships, working with programs of foreign student sponsoring agencies such as African-American Institute (AAI), Latin American Scholarship program of American Universities (LASPAU), Institute of International Education (IIE), Agency for International Development (AID), United States Department of Agriculture (USDA), and Food and Agriculture Organization of the United Nations (FAO).

Intensive American Language Center

The Intensive American Language Center provides concentrated English language training for non-native speakers of English who are preparing for university studies or who seek to improve their English for professional or personal purposes. Classes meet five to six hours per day, five days per week for eight-week sessions that run concurrently with WSU's academic calendar. Thus, students who wish to enter WSU and who are otherwise eligible for admission can move directly to university studies upon successful completion of the Language Center curriculum.

The Language Center provides classes in reading, composition, grammar, listening and conversation, and TOEFL preparation, using both individual and language laboratory training. Advanced students concentrate on academic studies. Six levels of classes are given, and students are placed in levels according to their individual proficiency in English.

Any non-native speaker of English, who is at least eighteen years of age and has completed secondary school may attend the Intensive American Language Center. Students may enroll full- or part-time. The Language Center is also prepared to negotiate special courses or package programs with domestic and foreign agencies on a contract basis. To apply or to obtain more information about the Language Center, contact the Office of International Education, Room 108, Bryan Hall, 335-4508.
Study Abroad Programs

Washington State University offers exchange programs with University College, Cardiff (Wales); Friedrich Wilhelms University, Bonn (Germany); Linkoping University, Linkoping (Sweden); Nihon University, Tokyo and Kansai University of Foreign Studies, Osaka (Japan); St. Stephens College, Delhi (India); Sichuan Institute of Foreign Languages, Chongqing, and Chengdu University of Science and Technology, Chengdu, (People’s Republic of China); University of Stirling, Stirling (Scotland); Landbouwhogeschool, Wageningen (The Netherlands); and Johannes Gutenberg University, Mainz (Germany). In addition, the university offers study abroad programs at the University of Copenhagen, Copenhagen (Denmark). Students majoring in foreign languages may select a program of study in Rennes (France), Seville or Alicante (Spain) through the Council on International Educational Exchange (CIEE). Washington State University is also a member of the Northwest Interinstitutional Council for Study Abroad (NICS), a consortium which offers programs in London (England), Avignon (France), and Cologne (Germany). As an Associate Institution in the Institute of European Studies, the university also offers programs in Great Britain, Germany, Spain, France, and Austria. Through the International Student Exchange Program (ISEP), students may select more than 60 universities in 23 countries.
Research Facilities

Computing Service Center

The Computing Service Center provides an extensive offering of information processing services to the university community, as well as to a number of other governmental agencies and institutions in the Pacific Northwest. The primary resource for computing power is an IBM 3090-200 with 64 megabytes of main memory, 32 I/O channels, over 40 gigabytes of on-line disk storage, 11 tape drives, a 20,000 magnetic tape library, two impact printers, two laser printers, a 24 megabyte high-speed paging device, a large multi-pen plotter, and support for over 1,350 telecommunication ports. Also available to users are the computing resources of a VAX 11/785 and a VAX 8200, a variety of microcomputers by IBM and Apple, and several special purpose computing systems.

The center makes available to its users both interactive and batch computing support. The basic operating systems include: VM/CMS, MVS, VM/CMS, WYLBUR, and CICS. Available through these systems are programmer utilities, compilers, modeling languages, statistical packages, text processors, mathematical routines, graphics programs, image analysis systems, word processors, office automation systems, data base systems, and a myriad of other software products.

Faculty and students may secure accounts for use on the 3090 by contacting the Information Center staff in the Computer Science Building. A number of public terminal laboratories are available in various buildings throughout the campus. The Information Center can provide the location of these laboratories and details for how to access them. Microcomputer laboratories are also available. A retail outlet is located in the Computer Science Building from which faculty and students can purchase IBM and Apple microcomputer products. Free training courses and user material are also available for those interested in using computer technology to assist them in their studies.

Electron Microscopy Center

The Electron Microscopy Center (EMC) located in Science Hall, is available for training and research in science and technology. Washington State University students, staff, and faculty members have access to the facilities for training, consultation, and service work under flexible conditions designed to provide maximal use of the EMC. Formal courses in electron microscopy, and undergraduate and graduate research (with or without credit) are offered by the center.

The EMC maintains three transmission electron microscopes (including an analytical TEM equipped with STEM, and EDX), a scanning electron microscope also with EDX, and a full complement of ancillary equipment and facilities. The center has a skilled staff experienced in handling a wide range of research problems in electron microscopy.

Environmental Research Center

The Environmental Research Center is an all-university research unit. The center is the focal point for university development of interdisciplinary research on problems related to the environment. It provides an organizational and administrative structure to accommodate interdisciplinary environmental research projects which cut across departmental and college boundaries.

The center is closely integrated with the academic program in Environmental Science and Regional Planning, and students are encouraged to participate in the research projects carried out through it. In order to stimulate an awareness of environmental problems and contributions the university can make in solving them, the center acts as an information source for faculty and students of the university and for citizens of the state. It also assists in securing financial support for research projects involving faculty and students and acts as a liaison unit for interuniversity and other cooperative activities dealing with environmental matters.

The center provides some direct support for graduate students and has sponsored a number of conferences and seminars on regional environmental problems.

International Marketing Program for Agricultural Commodities and Trade Center

IMPACT is the acronym for the International Marketing Program for Agricultural Commodities and Trade established in the College of Agriculture and Home Economics in June, 1985.

The IMPACT Center funds interdisciplinary research, extension and teaching to assist the state in exporting its agricultural products. Its major thrusts are in uncovering marketing opportunities, developing strategies to exploit those opportunities, solving economic and technical impediments to current agricultural exports, and finding alternative products or processes with export market potential.

The IMPACT Center receives its funding through the Washington State Department of Agriculture, and its programs are closely integrated with those of the department and of WSU's College of Agriculture and Home Economics. In carrying out its mission, the IMPACT Center funds faculty and staff for both long- and short-term assignments. Personnel are housed in the appropriate academic department or outlying station. While the IMPACT Center gives assistance to departments in providing graduate level courses in international agricultural marketing, it does not offer graduate programs.

Institute for Basic and Applied Energy Research

The Institute for Basic and Applied Energy Research was established in January, 1981. The institute is responsible for the promotion of research by various faculty groups having common energy-related interests in basic or applied research. The institute responds to the energy problems facing society by mobilizing highly trained faculty members into effective research teams, and disseminating the results of their research to campus and off-campus groups. A forum is also provided to help educate faculty, students, and the general public on current energy issues.

The Center for Fundamental Energy Research operates as a subunit of the Institute for Basic and Applied Energy Research. The faculty of the center consists of physical scientists engaged in basic research in photophysics; surface phenomena; metallic, polymeric, and crystalline materials; photovoltaic and thermophotovoltaic processes; homogeneous catalysis; and photoconductive, magnetic, and electrooptical materials.

Laboratory for Atmospheric Research

The Laboratory for Atmospheric Research provides a recognized center of atmospheric studies at Washington State University. The laboratory, which is administered through the College of Engineering and Architecture, provides students with graduate training in the atmospheric sciences. The academic program is administered through the Department of Civil and Environmental Engineering. Students are encouraged to participate in the various grant-supported research projects of the laboratory. Since atmospheric research requires an interdisciplinary approach, both the faculty within the laboratory and those who work cooperatively on joint research programs have diverse disciplinary backgrounds. Research areas include those of interest to the citizens and industries of the state, the nation, and the world. Thus, the laboratory is engaged in research aspects of meteorology, atmospheric chemistry, pollution abatement, global climate issues, and effects of atmospheric pollutants. Much of the research involves field measurement programs which have taken the faculty, staff, and students to such diverse places as China, the Antarctic Continent, the Caribbean, and the Pacific Ocean as well as numerous sites in the United States. Sampling platforms used include mobile trailers, towers, aircraft, and ships. Analytical technique development in the laboratory and computerized data interpretation including atmospheric modeling round out the laboratory research.

Nuclear Radiation Center

The Nuclear Radiation Center houses facilities for support of research on a university-wide basis. The facilities include a pool-type, 1,000 kilowatt
Research Facilities

TRIGA-III fueled reactor, a 12,000 Curie Cobalt-60 source, and associated advanced nuclear radiation detection equipment. The reactor power was increased to 1,000 kilowatts in 1967, with capability of pulsing to 1,500 megawatts.

Additional facilities available include a thermal column, beam ports, pneumatic transfer system for short-lived isotopes, and isotope production tubes. Equipment for use in experiments includes microprocessor-based multi-channel analyzers, large volume Ge(Li) detectors, 5" x 5" Na(Tl) detectors, ND 6620 and ND 6700 analyzer systems, low energy photon detector-MCA system, and low-level radiation detection systems. The center houses a trace element laboratory that specializes in neutron activation analysis but includes other trace analysis techniques. Trace element analyses are performed for other groups on the university campus. The center is also equipped for the measurement of environmental radioactivity and to study the behavior of radionuclides from nuclear research and nuclear waste facilities.

Social and Economic Sciences Research Center

The Social and Economic Sciences Research Center has three primary missions: (1) to facilitate and administer research in the social sciences that is responsive to the needs and concerns of the local, state, and regional communities, (2) to provide a telephone and mail survey capability to university faculty and others and to conduct research on improving the quality of surveys, and (3) to provide research training for both undergraduate and graduate students in the social sciences. The clientele of the Social and Economic Sciences Research Center include the students, faculty, and administration of Washington State University, and the citizens and agencies of the state. The center includes units on Aging, Alcohol and Drug Abuse, and Human Values. Research facilities include the Public Opinion Laboratory and a Data Processing Center operated jointly with other departments. The professional-technical staff of the center provide assistance in all facets of the research enterprise.

Faculty and students from social, behavioral, economic, and educational disciplines may become involved in center projects. Physical and biological scientists and engineering increasingly require social science participation in their research, and the Social and Economic Sciences Research Center is an active participant in such projects. Cooperation with other research centers and departments in the university lends a strong interdisciplinary emphasis to the work of the center.
Admission and Financial Aid

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.

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 policy of Washington State University to admit all applicants if the total evidence (academic records, test results, recommendations, and interviews) indicate 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 can be made available.

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

Application forms are available in the high schools and community colleges of Washington and the Office of Admissions.

The faculty and the Board of Regents of Washington State University have adopted the following requirements for admission:

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

Freshman Admission Requirements

Freshman applicants will be admitted on the basis of an Admissions Priority Number (APN) which will be calculated using the high school grade point average and test information taken from the results of the Washington Pre-College Test. For nonresidents and other applicants who have not been able to complete the Washington Pre-College Test, the scores of the College Board Scholastic Aptitude Test (SAT) or the American College Test program (ACT) may be substituted. The APN which will qualify a student for admission may vary from year to year. The APN is calculated on the official transcript information provided at the time of application.

Applicants who have not graduated from high school at the time of application must maintain a satisfactory record and provide evidence of graduation prior to enrollment.

Graduates of unaccredited high schools may be required to pass special validating examinations and should write to the Director of Admissions for further information.

Students applying for fall semester admission may submit the application at any time after December 1. Preference will be given freshman applications received by May 1. Applications for spring semester admission are accepted from September 15 to December 15.

A complete application includes the application form, the official high school transcript, the Washington Pre-College Test Data Sheet or the score report of the SAT or ACT, and a $25 nonrefundable application fee.

Beginning with students applying for freshman admission for the fall semester 1988, applicants will be required to submit a high school transcript showing completion of no less than the following course work in grades 9, 10, 11, and 12:

- **English:** Four years (including at least one year of composition and literature).
- **Mathematics:** Three years (normally one year of geometry and two years of algebra including an integrated algebra course, or precalculus).
- **Science:** Two years (including at least one year of laboratory science).*
- **Social Science:** Three years (including at least one year of history).
- **Foreign Language:** Two years of one single language.

Students applying for admission before 1988 should seek to meet these requirements as nearly as possible.

*It is strongly recommended that students planning to major in science or science-related fields complete at least three years of science (including at least two years of laboratory science).

Retention of Students

The grade point average for freshmen entering from high school in the fall semester 1985 was 3.17. Of the 2,396 freshmen who entered in the fall semester 1985 from the state of Washington, 2,216 were enrolled in the spring of 1985 and 1,821 were eligible to continue their enrollment in the fall semester of 1986.

Transfer Admission Requirements

Transfer students will normally be admitted if they show evidence of a 2.00 (C) or higher grade point average in transferable work completed in accredited post-secondary institutions. Transfer students should contact the Office of Admissions for information about special requirements.

Transfer applicants with less than 10 semester (15 quarter) hours of transferable credit must submit their high school transcript for review. Applicants with 10 or more semester (15 quarter) hours of transferable credit will be considered for admission on the basis of the college record alone.

Beginning with new applicants for Fall, 1988, transfer applicants with less than 27 semester (40 quarter) hours of transferable credit must submit their high school transcript for review. Applicants with 27 or more semester (40 quarter) hours of transferable credit will be considered for admission on the basis of the college record alone.

College-level work completed in accredited higher institutions is given appropriate credit upon transfer to Washington State University but shall not be granted for more than the number of years for which the institution is accredited. The maximum transfer credit allowed from accredited two-year community junior colleges shall be 60 semester (90 quarter) hours toward a baccalaureate degree irrespective of when those hours were earned. The maximum allowable credit toward a four-year degree shall be 90 semester (135 quarter) hours. For a five-year degree program the maximum credit allowed for transfer is 120 semester (180 quarter) hours.

Students who have completed an approved Associate of Arts or Associate of Science degree at a Washington community college including a course pattern which approximates the General University Requirements (CURs) for Graduation of Washington State University, as determined by the WSU Office of Admissions, will be considered to have fulfilled the General University Requirements. In addition to CURs, students will be required to meet all departmental and college requirements for graduation.

Transfer students applying for fall semester admission may submit the application at any time after December 1. Preference will be given to transfer applications received by June 1. Applications for spring semester admission are accepted from September 15 to December 15. A complete application includes the application form, an official transcript from each college or university attended showing work completed at the time of application, and a $25 nonrefundable application fee. Final and complete transcripts must be submitted prior to the student’s initial enrollment.

Washington State University recognizes academic credits earned at other accredited college institutions which are essentially equivalent in academic level and content to work offered at WSU. Toward this end, the university subscribes to the Policy on Inter-College Transfer and Articulation Among Washington Public Colleges and Universities endorsed by the public colleges and universities of Washington and the State Board for Community College Education, and published by the Higher Education Coordinating Board. The policy deals with the rights and responsibilities of students and the review and appeal process in transfer credit disputes.

For more detailed information, contact the WSU Office of Admissions.

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 including, but not necessarily limited to, architecture, business administration, communications, computer science, construction management, economics, education, engineering, hotel administration, interior design, landscape architecture, nursing, pharmacy, and veterinary medicine 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. Students applying for admission to selective programs should contact the Office of
Admissions regarding special requirements and application deadlines. For instance, applicants for veterinary medicine must apply by November 1; nursing by February 15; architecture and pharmacy by March 1; and engineering by April 15. Deadlines may be changed at any time.

Foreign Student Admission Requirements
Washington State University encourages the application of qualified students from other nations to complement its cosmopolitan student community. Applicants must submit official copies of all academic records, the Test of English as a Foreign Language (TOEFL), scores, and evidence of adequate financial resources to meet the costs of the proposed study. Each application is carefully considered on its individual merits.

Selection of a Major
Students seeking a university degree must organize their efforts in a particular department or group of related courses. This is the student's major which should be selected early. Some academic majors have specific requirements which must be met before a student is allowed to certify a major. These requirements are listed in the departmental section of this catalog. If an entering freshman knows with reasonable certainty what the major interest is to be, that interest may be specified on the application for admission. Students may, if they choose, defer this selection until, but not beyond, the end of the sophomore year. Each freshman is assigned an adviser in the major interest area by the Director of the Curriculum Advisory Program. This adviser can be changed if the student's original interest should change. Students unable to specify a major interest area will be assigned to a general adviser.

Students who have met departmental certification requirements may be eligible to certify a major after the completion of the freshman year (30 semester hours). The chairperson of the major department then becomes the adviser of record.

Students with advanced standing who transfer more than 30 semester hours normally are certified as departmental majors unless they are uncertain about their major or have not met departmental certification requirements. Transfer students who are not certified to a major are assigned to advisers in their area of interest by the Curriculum Advisory Program.

Students interested in completing a minor or second major should consult the department concerned. Formal certification of a minor or second major is completed after the student has finished 90 semester hours. Approved minors are identified in the departmental section of this catalog.

Graduate Admission Requirements
Applicants for admission to the Graduate School must meet the special requirements of the Graduate School and the particular program desired. For complete information, refer to page 31 of this catalog.

Former Students Returning – Not Enrolled the Previous Semester
Students formerly enrolled at Washington State University and who wish to return must submit an application for reenrollment. Preference will be given to applications received by July 1 for fall semester and December 15 for spring semester.

Former students returning whose previous academic record at Washington State University is unsatisfactory will be required to follow established academic reinstatement procedures prior to reenrollment.

Students returning who have attended other institutions since last enrolled at Washington State University must submit an official transcript from each institution attended. Applicants will normally be required to have at least a 2.00 (C) grade point average in all such work.

Requests for reenrollment information and applications should be made to the Office of Admissions.

Advance Payment on Tuition and Fees
All undergraduate applicants including former students returning, except special students, contract students, and foreign students (other than Canadians) living outside the USA, are required to submit a nonrefundable advance payment on tuition and fees in the amount of $50 prior to final admission. The advance payment will be requested of those applicants who are eligible for admission and should not be submitted until notice of eligibility is received by the applicant. The payment should be sent directly to the Controller not later than May 1 for freshmen or June 1 for transfers seeking admission for the fall semester. The payment deadline is December 15 for all spring semester applicants.

Credit by Examination
Recognizing the natural ability and education experience of many of its applicants, Washington State University has developed a broad program of credit by examination.

Credit and placement may be granted for students who submit scores of three or higher on College Board Advanced Placement Examinations (AP). The College Board College Level Examination Program (CLEP) may also yield credit. Up to six semester hours of credit for CLEP general examinations are available for the humanities and arts, social sciences, and sciences general examinations passed at or above a standard sub score of 48. Subject examinations of CLEP yield variable credit as determined by the appropriate academic departments. No CLEP credit will be granted to students with 60 or more semester hours of credit. Some academic departments use national examinations, the results of the Washington Pre-College Test, and departmental examinations in considering students for advanced placement and credit.

Students who want specific and complete information should write to the Office of Admissions.

Matriculated students 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 General University Requirements for Graduation. For further information contact the Registrar or see Academic Regulations printed in the Fall Term Schedule.

Expenses and Financial Aid

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<td>Medical Expense Insurance (optional)³</td>
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¹Subject to change by the Board of Regents.
²Estimated cost.
³Required of all foreign students.

Other Costs
$15 refundable damage deposit required of all students.
$60 security deposit required of those living in residence halls.
$25 motor vehicle registration for on-campus students.
$35 motor vehicle registration for off-campus students.

Tuition and fees must be paid in full at registration. Incoming students receive information about registration and orientation activities prior to coming to campus.

Student Financial Assistance
Federal assistance programs include Perkins Loans (National Direct Student Loans), Guaranteed Student Loans, Pell Grants, Supplemental Educational Opportunity Grants, College Work Study employment, and Health Professions and Nursing Loans. State sponsored programs include tuition and fee waivers, State Work Study employment and State Need Grants. University sources of aid include scholarships, institutional grants, and part-time job opportunities. Financial aid counselors are available to assist students and families in planning to meet their costs of education through financial aid and/or other alternative financial services.

The College Scholarship Service Financial Aid Forms (FAPs) and information are available from the WSU Office of Scholarships and Financial Aid, 139 French Administration Building. Priority deadlines for receipt of completed application forms are determined on an annual basis. The specific deadline dates are published in the informational brochure. Full consideration for all types of aid, including academic scholarships, can be given only to those whose forms are received by the deadline. Students who apply late will be assisted on the basis of available funds and will be counseled about possible alternative resources.
Disabled Students

The state of Washington administers several programs of assistance to disabled students. Blind students who are residents of the state of Washington may receive financial assistance under provisions of either RCW 28B.10.210 through 28B.10.220 or RCW 74.16.011 through 74.16.183. Inquiries concerning eligibility under this program should be addressed to Services for the Blind, 3411 South Alaska Street, Seattle, Washington 98118.

Other students or prospective students who are residents and have a vocational handicap may be eligible for assistance through the vocational rehabilitation program administered by the state of Washington. Information concerning eligibility should be directed to the Department of Social and Health Services, Division of Vocational Rehabilitation, Olympia, Washington 98504.

Federal Veterans Benefits

The Veterans Affairs Office, 346 French Administration, cooperates with the Veterans Administration in carrying out the provisions of the public laws established to give educational benefits to veterans and dependents of deceased or totally disabled veterans.

Students should apply for admittance to the university and for VA benefits simultaneously. Application for benefits should be made to the Veterans Administration Regional Office in Seattle or the WSU Coordinator of Veterans Affairs at a Federal Veterans Benefits. There is currently a two-month delay between approval of the application and receipt of monthly benefit checks for most recipients, and four to six months delay for Chapter 32 and Section 901/902 veterans.

Veterans receiving benefits under the old GI Bill or Chapter 31 Vocational Rehabilitation may be eligible for tutorial assistance and work study. Dependents may be eligible for financial assistance. Application forms and information can be obtained from the Coordinator of Veterans Affairs.

State Veterans Benefits

1. Veterans who (1) served in the Southeast Asian theatre of operation between August 5, 1964, and May 7, 1975, (2) received other than dishonorable discharge, and (3) qualify as a Washington resident as defined in RCW 28B.15.012, may qualify for the Minnesota Veterans Tuition Increase Exemption. Veterans claiming this special exemption should apply by providing proof of required service to the WSU Coordinator of Veterans Affairs.

2. Qualified Vietnam Veterans are exempted from the payment of general tuition and operating fees (service and activities fees will not be waived).

To qualify for this exemption, the veteran must:

a. Have served between August 5, 1964 and May 7, 1975,
b. Have been released from service with other than dishonorable discharge,
c. Have completely exhausted all federal educational and vocational benefits including any extensions,
d. Have been enrolled at Washington State University prior to October 1, 1977,
e. Maintain full-time enrollment and be a full-time student,
f. Apply the exemption toward the completion of a degree program in which the veteran was working at the time federal benefits were exhausted,
g. Be a legal resident of the state of Washington (as described in RCW 28B.15.012), and
h. Apply for the exemption through the Office of Veterans Affairs each semester.

3. The children of any veteran who was a Washington domiciliary and who had been determined by the federal government to be a prisoner of war (POW) or missing in action (MIA) in Southeast Asia including Korea (1962 or thereafter), will be admitted to Washington State University without the necessity of paying tuition or fees, provided that such student meets standard admission requirements. Prospective students who wish to qualify for this exemption should contact the Coordinator of Veterans Affairs.

Waiver of Fees for Children of Law Enforcement Officers and Firefighters

Students over the age of 19 who are the children of law enforcement officers or firefighters who lost their lives or became totally disabled in the line of duty while employed by any public law enforcement agency or full-time or volunteer fire department in the state of Washington may be exempted from the payment of tuition and fees. Students claiming this special exemption should apply to the WSU Controller, Student Accounts Section, and provide legal documentation of the death or disablement under the conditions prescribed for eligibility in RCW 28B.15.380.

Waiver of Fees for Persons Age 60 and Over

Persons age 60 or over who are residents of the state of Washington may enroll under the tuition and fee waiver. Applicants will be asked to sign a statement that courses taken under the fee waiver will not be used toward credentials or salary schedule increases. Tuition-exempt students will be admitted to class on a space available basis. All students enrolling under the fee waiver are responsible for paying a $5 nonrefundable registration fee, plus any special course fees.

Courses numbered 499, 600, 700, 702, and 800; internships; and self-sustaining courses may not be taken under the fee waiver.

Credit Enrollments. Enrollment for credit under the fee waiver is limited to 6 hours per semester or 3 hours per summer session. Applicants must be admitted to the university and obtain the fee waiver form from the Registrar’s Office, prior to registration. Detailed procedures for credit enrollments under the fee waiver are listed in the Time Schedule.

Audit Enrollments. Auditing under the fee waiver is limited to two courses per semester or summer session. Laboratory courses may not be audited. Applicants wishing to audit should report to the Registrar’s Office during the first week of classes to obtain the “Permission to Audit” card. The instructor’s signature is required for auditing and cannot be obtained prior to the first day of classes.

Staff/Faculty Fee Waiver

A fee waiver option is available to full-time classified staff, faculty, and exempt employees who wish to enroll for six credits or less per semester or three credits in a Summer Session. Qualified personnel who wish to enroll under this program must follow regular admission procedures and present a completed Staff/Faculty Registration Authorization Form at the time of enrollment. Complete information on this fee waiver program is listed in the Time Schedule.
Living Facilities

The university has residence hall space for 5,700 students. There are 23 residence halls, including a graduate center housing 300 students. Some halls are women-only halls, some are men-only halls, and some are coeducational. Facilities for use by handicapped students are provided. Residence hall information may be obtained by writing to the Housing and Food Service, Streit-Perham Building, Pullman WA 99164-1722.

Twenty-four national social fraternities and 14 national social sororities currently maintain chapters at Washington State. The chapters vary in size from 30 to 130 people. For information write: Panhellenic and/or Interfraternity Council, Streit-Perham Building, Pullman WA 99164-1726.

Students living in residence halls, fraternities, and sororities elect their own officers, and each affords many opportunities for leadership experience. Panhellenic considers matters of common interest to sororities, while the Interfraternity Council represents the fraternities. The Residence Hall Association acts on behalf of the residence halls.

Housing Regulations

All single undergraduate freshmen under 20 years of age are required to live in organized living groups which are officially recognized by the university (residence halls, fraternities, and sororities) unless they are residing with parents or legal guardians. Exemptions are granted when a student demonstrates to the Office of Student Affairs that (1) he/she has attended an institution of higher education as a regularly enrolled student for at least two regular semesters or three regular quarters (excluding summer sessions), (2) he/she is living with immediate family in a family situation (mother and/or father, legal guardian, married brother or sister, aunt or uncle, grandparents qualify as immediate family), (3) he/she has secured a statement from a physician that residence in a living group would have detrimental effects on the student's physical health or emotional well being.

Residence Halls and Dining Halls

Washington State University can normally provide space in its residence halls for most beginning students who request it. The estimated cost of room and board per person, multiple occupancy and meals for the 1987-88 academic year is estimated to be $2700; and for the 1988-89 academic year, $2850. This amount is to be paid prior to registration or on an arranged installment basis. A security deposit and a signed room and board contract are required before space can be reserved.

A student desiring to cancel an advance room reservation and receive a partial refund of the security room deposit must notify the Program Assistant for Residence Halls, Streit-Perham Building. Once the applicant has been assigned to a hall, the security deposit is initially held to ensure occupancy of the space, and then to guarantee against damage, breakage, and loss during the student's stay in the hall. The deposit is held until the individual permanently leaves the residence hall system.

All students residing in the residence halls purchase the Board Bank meal plan for use in university-operated dining halls. The dining halls are managed by trained food service personnel and are operated on a nonprofit basis.

The Board of Regents establishes rules for the use of residence halls and other university housing. The university reserves the right to use the unassigned beds in any of the residence halls at any time.

Washington State University is not liable for the loss of money or valuables by any person, or for the loss of, or damage to, any resident's property, or personal injury sustained on the premises. It is urged that appropriate insurance be obtained prior to hall occupancy.

Family Student Housing

The university maintains approximately 300 apartments for students with legal dependents in residence. A rental request for such a unit will be considered when an application and a security deposit of $60 are received. Units for use by handicapped students are available on a limited basis. For detailed information write to Family Housing, Housing and Food Service, Streit-Perham Building, Pullman WA 99164-1722.

Single Student Apartments

The university operates 419 apartments that are available to unmarried students desiring apartment-type living. Sophomores and above are eligible for this type of housing. Apartments for use by handicapped students are available on a limited basis. An application and $60 security deposit are required before a request will be considered. Most units are two bedroom, and are completely furnished except for linen, kitchen utensils, cleaning equipment, and study lamps. Normally two, three, and four students make up each living group. For further information, write to Single Student Apartments, Housing and Food Service, Streit-Perham Building, Pullman WA 99164-1722.
Tuition and Fees

Tax sources of the state finance the major portion of facilities and operation of the instructional programs, student services, and related activities. Students share in the costs by paying tuition, fees, and other charges as established by the Board of Regents.

Payment of registration fees is due on or before the fifth day of each semester. Payment after that day will result in a late payment fee.

### 1987-88 Registration Fees

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### 1988-89 Registration Fees

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<td>(per credit hour; minimum charge 2 credit hours)</td>
<td>26.00</td>
<td>26.00</td>
<td>26.00</td>
<td>26.00</td>
</tr>
<tr>
<td>Undergraduate</td>
<td>90.00</td>
<td>250.00</td>
<td>26.00</td>
<td></td>
</tr>
<tr>
<td>Graduate</td>
<td>130.00</td>
<td>324.00</td>
<td>26.00</td>
<td></td>
</tr>
<tr>
<td>DVM</td>
<td>211.00</td>
<td>534.00</td>
<td>36.00</td>
<td></td>
</tr>
</tbody>
</table>

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1. Fees are based on credit hour enrollments: 1-6 credits are charged part time fees; 7-18 credits are charged full time fees; 19 credits and above are charged full time fees plus a per credit hour charge for each credit over 18. The credit hours listed in this table are for fee purposes only. "Full Time Enrollment" is normally 12 credit hours—see definitions listed on page 21 of this Catalog.

### Advance Payment (see p. 14)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ADVANCE PAYMENT</strong></td>
<td>$50.00</td>
</tr>
</tbody>
</table>

### Deposits

General University Damage Deposit (required of all students) $15.00. Refund checks of all or balance of deposits are mailed within six weeks after the close of the school year. (The $15 Damage Deposit is used for the Chinook yearbook if Chinook is ordered at the time of registration.)

### SPECIAL REGISTRATION FEES

1987-88: 1988-89

<table>
<thead>
<tr>
<th></th>
<th>1987-88</th>
<th>1988-89</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directed Teaching</td>
<td>$687.00</td>
<td>$713.00</td>
</tr>
<tr>
<td>(EL/Ses 405 or 406 and/or AGHE 407 only)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>two blocks</td>
<td>866.00</td>
<td>890.00</td>
</tr>
<tr>
<td>Pullman High School Cooperative Program</td>
<td>116.00</td>
<td>120.00</td>
</tr>
<tr>
<td>Psych 595 only</td>
<td>81.00</td>
<td>84.00</td>
</tr>
<tr>
<td>V MS 562 and 567</td>
<td>1001.00</td>
<td>1039.00</td>
</tr>
<tr>
<td>FKM 407, 517, and 545</td>
<td>50.00</td>
<td>50.00</td>
</tr>
<tr>
<td>No-Credit Graduate Enrollment (annual)</td>
<td>41.00</td>
<td>43.00</td>
</tr>
</tbody>
</table>

Consult the Time Schedule for additional fees related to specific courses.

### Other Fees and Charges

(not necessarily applicable to all students)

- Adding a course charge for each course added after 10th day of semester $5.00
- Admission Application, undergraduate (nonrefundable) 15.00
- Auditing a Course charge for each audit hour 25.00
- (does not apply to full fee-paying students) 35.00
- Basic Skills Proficiency Test 35.00
- Challenging a Course charge for each challenge examination petition (see Rule 15) 75.00
- Copyright 20.00
- Dishonored checks, service charge 10.00
- Entrance exam: qualifying graduates of unaccredited high schools test 10.00
- Foreign Language reading examination 10.00
- Foreign Student Orientation required of all new foreign students 20.00
- Graduate School application 10.00
- Graduation application, bachelor’s degree 10.00
- Graduation, master’s and doctor’s degrees 25.00
- ID card, charge for replacement 10.00
- Late payment after 5th day of semester 15.00
- Late payment after 30th day of semester 50.00
- Late registration on or before 10th day of semester 15.00
- Late registration after 10th day of semester 50.00
- Medical Expense Insurance (est. annual) (optional for all but foreign students) 170.00
- Microfiling applicable to PhD and EdD degree candidates only 42.00
- Placement Bureau Credential Service fee assessed after graduation for each set of credentials 3.00
- Re-enrollment Fee (charged to students who pay tuition and fees after disenrollment for nonpayment) 100.00
- Sponsored Foreign Student Administrative Charge fall or spring 180.00
- summer 100.00
- Sports Pass (optional) Fall and Spring Semester All Sports Pass 55.00
- Fall Semester Sports Pass 45.00
- Spring Semester Sports Pass 20.00
- Student Health Fee (per semester) 40.00
- fee assessed to all full time students Teacher’s Statutory Certification 17.00
- Transcript (per copy) 3.00
- Veterinary Medicine application 25.00
- Washington Student Lobby (optional) 1.00

Note: Overdue accounts owed the university will prevent release of transcripts and enrollment. Registration is not complete until all of the student’s tuition and fees are paid.

19
Resident Status

Residency for tuition and fee purposes is determined by Section 4, Chapter 37, Laws of 1982, First Extraordinary Session and regulations contained in Chapter 250-18 WAC.

The administration of resident status shall be the responsibility of the Board of Regents. The Director of Admissions is assigned the responsibility to represent the Board of Regents on questions of resident status.

A resident student is one who is financially dependent upon a parent or legal guardian who maintains a bona fide domicile in the state of Washington or a financially independent student who maintains a bona fide domicile in the state of Washington for other than educational purposes. Financial dependence or independence shall be determined by the amount and kind of financial assistance given to a student and whether or not the student has been claimed as a deduction on income tax forms in the year immediately preceding the semester for which residency is sought. The term domicile denotes a person’s true, fixed and permanent home and place of habitation.

Active duty United States military personnel who have been stationed in the state of Washington for one year shall be considered as having resided in the state for purposes primarily other than educational and shall be considered financially independent. During the first year of official assignment to a station in the state of Washington, military personnel and their spouses and dependent children may request a waiver of nonresident tuition and fees.

Evidence to be considered in the establishment of residency must have existed no less than 12 consecutive months and may include the following:

1. Registration of motor vehicles, motor homes, travel trailers, boats or other personal property.
2. Driver's license.
3. Employment records.
4. Income tax returns.
5. Voter registration.
6. Selective service registration.
7. Purchase of primary residence, lease agreement or monthly rental receipts.
8. Resident status of students in schools attended outside the state of Washington.
9. Membership in professional, business, civic or other organizations.
10. Records of checking or savings accounts and safety deposit box rental.

Once a student's residency classification has been determined, that classification will remain unchanged in the absence of written evidence justifying change during the time the student is in continuous enrollment.

Applications for change in resident status and all supporting evidence must be submitted to the Office of Admissions no later than the 30th calendar day following the first day of instruction of the semester for which application is made, assuming the student is qualified for resident status on the first day of classes of the semester. The burden of proof of resident status lies with the student.

Appeals of institutional determination of classification shall be subject to court review only under procedures described in Chapter 28B.19. If erroneous, untrue, or incorrect information submitted on an application results in an improper classification of resident or nonresident status or a final determination is reversed through the appeals process, institutions shall recover from the student or refund to the student, as the case may be, an amount equal to the total difference in tuition and fees had proper classification been made.

In accordance with RCW 28B.15.014 certain nonresidents shall be exempt from paying the nonresident tuition and fee differential. To be eligible for an exemption a nonresident student must provide documented evidence that he/she resides in the state of Washington and (1) holds a graduate service appointment involving not less than 20 hours per week; (2) is employed for an academic department in support of instructional or research programs involving not less than 20 hours per week; (3) is a faculty member, classified staff member, or administratively exempt employee holding not less than a half-time appointment or the spouse or dependent child of such a person; (4) is an active duty military personnel of field grade or lower rank or the spouse or dependent child of such person, for the first twelve months stationed in the state of Washington; or (5) is an immigrant having refugee classification from the U.S. Immigration and Naturalization Service or the spouse or dependent child of such refugee; if the refugee is on parole status, or (b) has received an immigrant visa, or (c) has applied for United States citizenship. Exemption from nonresident tuition and fee differential shall apply only during the term(s) such person shall hold such classification, appointment, or be employed.

Refund Policy

Full refund, fall and spring semester: Tuition, operating, student service and activity fees, the Student Health fee, and the Washington Student Loan fee will be refunded in full if the student officially withdraws from the university prior to the sixth day of instruction of the semester for which fees have been paid.

Fifty percent refund, fall and spring semester: If the student withdraws on or after the sixth day of instruction but within 30 calendar days from the beginning of instruction, 50 percent of tuition, operating, student service and activity fees, and the Student Health fee will be refunded. After 30 days from the beginning of instruction, no portion of the fees will be refunded.

Summer Session registration fee refund rules are published in the Summer Bulletin.

For short courses and sessions of less than four weeks' duration, the refund period is 24 hours after the official start of the session.
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.

Registration

Instructions for registration, and policies and procedures for dropping and adding classes are included in the Time Schedule, available in the Registrar’s Office. Students have the option of preregistration, or may register just prior to the start of each term with class schedules/fee statements distributed the day before classes begin. For the fall and spring semesters, students have one week to pay tuition and fees. For summer session, fees must be paid at the time of registration.

Enrollment Limit

The average semester credit load for undergraduate students is 15 credit hours. Students are not normally advised to enroll for more than 18 credit hours. When warranted, superior students may enroll for credits in excess of this limit. Students will not be allowed to enroll for 20 or more hours (10 hours for summer session) without written overload approval from their major department chairperson or CAP advisor. (See Tuition and Fees for additional credit hour charge over 18 hours.)

Student ID Card

Student photo ID cards are required for library privileges, admission to events and activities, obtaining and cashing checks, and general university use. New students will have their photos taken during orientation. Photo ID cards are validated each semester during registration. The photo ID card and the athletic sports pass are required for all WSU athletic events. The photo ID card with validated food service privileges will be required for service in all university dining halls.

Credit

Washington State University operates on the semester calendar. Each semester is of 15 weeks duration plus one week of final examinations. One semester hour of credit is assigned in the following ratio of component hours per week devoted to the course of study: (1) lecture—one contact hour per week for each credit hour (2 hours outside preparation implied); (2) studio—two contact hours per week for each credit hour (one hour outside preparation implied); (3) laboratory—three contact hours per week for each credit hour; (4) independent study—three hours of work per week for each credit hour; (5) ensemble—four contact hours per week for each credit hour. The proportion of time in each course assigned to lecture, studio, laboratory, independent study, 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.

Credit Hour Requirements for Full-Time Enrollment

The normal load for an undergraduate student is 15-16 credit hours per semester. Twelve credit hours per semester is considered a full load for undergraduate and graduate students. (Eight hours in the eight-week summer session is full time for both undergraduate and graduate students.) Part-time students do not share in certain student body privileges such as participation in recognized activities, Student Health Service, and Student Publications. Graduate students on half-time teaching or research assistantships are expected to carry 10-14 credits per semester with no more than 12 hours of graded credit (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.

Tuition and Fees: Based on credit hour enrollment. See page 19 of this catalog.

Financial Aid: For financial aid purposes, full-time enrollment for an undergraduate student is 12 hours and half-time enrollment is considered to be 6 through 11 hours. For graduate students, full-time enrollment is 10 hours and half-time enrollment is considered to be 5 through 9 hours. Certain financial aid programs or policies such as State Need Grant and Tuition and Fee Waivers require a student to be enrolled full time.

Loan Deferrals: Enrollment certifications for deferrals on National Direct Student Loans and Guaranteed Student Loans, with no break in enrollment, require at least half-time enrollment (6 semester hours) for undergraduate and graduate students. Five semester hours constitutes half-time enrollment for a graduate student on a half-time assistantship.

Guaranteed Student Loans deferrals, with a break in enrollment, require full-time enrollment (12 semester hours) for undergraduate and graduate students. Ten semester hours will 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-time paying student and must be and remain in good academic standing.

Veterans’ Benefits: Requirements for Veterans’ Benefits under Chapter 34 (G. I. Bill), Chapter 35 (War Orphans Act), Chapter 31 (Vocational Rehabilitation), Chapter 32 (VEAP program), Section 901/903 (test G. I. Bill), Chapter 106 (Reserve/Guard Bill), and Chapter 30 (new G. I. Bill), are 12 undergraduate or 8 graduate hours for full-time benefits. (During the eight-week summer session, 7 graduate or 4 graduate hours are considered full-time.) Detailed information on eligibility requirements may be obtained through the WSU Office of Veterans Affairs.

Foreign Students Holding F-1 Visas: The Immigration and Naturalization Service requires that nonimmigrant F-1 students be enrolled in a full course of study for the entire semester (12 semester hours for undergraduate students and 10-12 semester hours for graduate students per semester excluding summer session). Additional information on these requirements may be obtained from the Office of International Education.

Auditing

No university credit will be allowed for auditing courses. To visit a class more than three times requires an audit card which must be obtained from the Registrar. The written permission of the adviser and the instructor is required. Ordinarily audit cards will be issued only for lecture courses or the lecture portion of laboratory courses. An audit fee is charged for other than regularly enrolled full-fee-paying students.

Cancellation of Enrollment

(See Academic Regulations, Rule 76, Withdrawal from the Institution.)

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 Office of Student Affairs. Dropping all courses constitutes withdrawal from the university.

Classification of Students

Undergraduate students who have completed less than 30 semester credits are classified as freshmen, 30-59½ semester credits as sophomores, 60-89½ semester credits as juniors, and 90 and above as seniors.

Graduate non-degree students are those who have received the bachelor’s 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.
Numbering System of Courses

Lower-division
Courses numbered below 100 do not carry university credit.
Courses numbered 100-199 inclusive are normally taken by freshmen.
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 head (see p. 32).
Courses numbered 600-800 have as a prerequisite regular student status in the Graduate School.

Course Prerequisites

When applicable, prerequisites are listed in this catalog with the specific course description, preceded by the abbreviation "prereq." 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 (Math 171) requires a prerog of Pre-calculus (Math 107), meaning that the student may not enroll for Calculus until successfully completing Math 107. Prereqs may also be general as "one semester of chemistry or concurrent enrollment" (see Bio S 103; concurrent enrollment is indicated by the symbol c/). Prereqs may include a level of expertise or a specified major, e.g., students may not enroll in Spanish 324 without first being fluent in Spanish, or students may not enroll in an advanced seminar before achieving senior standing in the major.

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 the prereq 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 will be accomplished, alternatives (if any), and the consequences of not participating in the required field trip.

When travel is required, the responsible faculty or staff member should arrange for the transportation. If classes are to be missed, the responsible faculty or staff member should also provide the student participants with a statement concerning absence from classes that can be given to the students' instructors. Transportation can be scheduled through the university motor pool in accordance with section 95.35, Business Policies and Procedures Manual. The university's liability coverage is provided by Chapter 4.92 of the Revised Code of Washington (RCW). In those instances where students are permitted to drive their own cars and other students are permitted to ride with them, the responsible faculty or staff member, acting as the university's representative, should request the student driver to verify that:

1. He/she has a valid driver's license.
2. He/she has minimum liability insurance required by the state of Washington ($25,000 bodily injury per person, $50,000 per accident, $10,000 property damage).
3. The student driver's vehicle meets the state's standard safety requirements.
4. The passenger capacity of the vehicle will not be exceeded.

The supervising university representative should also ensure that participants are appropriately dressed and properly advised as to safety requirements for the activity involved.

Certification of a Major

An undergraduate may certify an academic major upon completion of 30 semester hours with the approval of the Director of the Curriculum Advisory Program and the appropriate department head.

A student who has completed 60 semester hours must certify a major as a condition to further enrollment. The student initiates the certification procedures in the Curriculum Advisory Program office, acquires the signatures of the academic adviser and the department chair, and returns the signed documents to the CAP office. Certified majors who wish to transfer to another academic major do so by requesting, from the Registrar's Office, a "Change of Major" card, and obtaining the approval and signature of the department heads of the former major and the new major.

Students who satisfy the minimum university requirements plus any departmental core requirements with a 2.0 cumulative g.p.a. are qualified for certification except in those departments which are impacted or must meet special certification standards. 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 including architecture, business, communications, computer science, construction management, economics, education, engineering, fine arts, hotel administration, interior design, landscape architecture, nursing, pharmacy, and veterinary medicine 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 30 hours for certification and a g.p.a. higher than the minimum 2.0. Academic units may also require completion of one or more specific 100- or 200-level core 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.

Minor or Second Major

A student who has completed 90 semester hours may certify a second major or a minor with the approval of the department concerned. The student should consult with the department concerning hours and grade point requirements and an approved schedule of studies to meet such requirements.

A second major requires completion of departmental requirements for the major exclusive of General University Requirements. A minor requires a minimum of 16 semester hours, half of which must be in upper-division course work. Upon completion of the requirements, the department will notify the Registrar, and the minor or second major will be posted on the student's permanent record (transcript). A list of approved minors is published in the Fall Time Schedule and Catalog Supplement.

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 (-) signs 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). A student's work is normally rated in accordance with the following definitions:

A—4 grade points per credit hour. To obtain this grade, the student must have shown uniformly the following qualities: (1) thorough comprehension and retention of both the facts and the principles of the subject;
Courses taken by correspondence do not yield grade points and carry no graduate credit. Grades earned through Continuing Education and Public Service courses sponsored by Washington State University yield grade points toward graduation. Correspondence or extension work submitted for transfer credit yields credit only if completed with a grade of C or better.

Grade Reports
Midsemester grades are issued to freshmen students with less than 24 semester hours of credit and are mailed to the student’s local or school address. Final grade reports for all students are mailed to the student’s permanent home mailing address at the end of the fall and spring semesters. Only one grade report is produced per student. Students requesting an additional grade report must order a copy of their official transcripts.

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 $3 fee per copy. Phone orders for transcripts cannot be accepted. 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.

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 only if there is space available in the course. If a student repeats a course in which an I (incomplete) grade was received, the incomplete 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. It is the student’s responsibility to indicate repeat courses on the registration form. Repeats by correspondence, extension, or in residence at other institutions must be reported orally or in writing to the Registrar’s Office. If a student transfers a course to WSU from another institution, and subsequently repeats the course at WSU, only the credit and grade points earned at WSU will be allowed.

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 a Special Topics course where 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.”

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 on the Registration Form that they wish to enroll in the course on a pass-fail basis. The adviser’s approval and signature are 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 will change all grades of A through D to P for those enrolled pass-fail. The P (pass) grades earned by pass-fail enrollees will not be included in computing the g.p.a.; however, grades earned by pass-fail enrollees will be included in g.p.a. computations. Courses approved for S, F grading (Rule 90) are excluded from the pass-fail option. Courses approved for S, F grading are footnoted in the Time Schedule.

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 fifteenth week), a pass-fail enrollment can be changed to a letter-graded 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 General University 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. One course is the limit for summer session. Students in the College of Veterinary Medicine with adviser 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:

<table>
<thead>
<tr>
<th>Credits</th>
<th>Pass-fail Allotment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-44 credits</td>
<td>6 courses</td>
</tr>
<tr>
<td>45-59 credits</td>
<td>5 courses</td>
</tr>
<tr>
<td>60-74 credits</td>
<td>4 courses</td>
</tr>
<tr>
<td>75-89 credits</td>
<td>3 courses</td>
</tr>
<tr>
<td>90 and above</td>
<td>2 courses</td>
</tr>
</tbody>
</table>

University Honors Program courses may be taken on a pass-fail basis only with the permission of the Honors Program Coordinator.

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 or fail basis.

Honors

President's Honor Roll. An undergraduate student will be named to the President’s Honor Roll by achieving a grade point of 3.75 for at least 12 hours of graded work in a single semester, or achieving a cumulative grade point average of 3.50 based on at least 30 hours of graded work at Washington State University.

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 3.80 or better, and will graduate cum laude if the minimum cumulative grade point average is 3.50 but less than 3.80. The appropriate Latin phrase will be printed on the diploma and on the final transcript. Qualified students electing to participate in the Honors Program who complete its requirements satisfactorily, regardless of whether they qualify to graduate summa 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 will recompute the student's g.p.a. including the last semester's work, and only this computation will determine official graduation honors.

Academic Complaint Procedure

Students having complaints relative to instruction or grading should refer them first to the instructor and if not resolved then to the chairperson of the department in which the course is offered. The chairperson, if not able to resolve the problem to the student's satisfaction, will refer the complaint, presumptively with the chairperson's written impressions, to the Dean of the College. The student is encouraged then to go directly to the Dean of the College. The Ombudsman, the Dean of Students, the Discriminatory Practices Coordinator, the Vice President for Student Services, and Provost are always available for any complaint not resolved to the student's satisfaction.

Academic Deficiency

Undergraduate students are expected to maintain at least a 2.00 cumulative grade point average during their academic career at WSU. A student who falls below a 2.00 cumulative g.p.a. or who falls below a 2.00 semester g.p.a. for two consecutive semesters is considered academically deficient.

Students in the Curriculum Advisory Program who are deficient must apply to the Office of Academic Standing for reinstatement. For certified majors the Office of Academic Standing grants to the student's academic department the decision on reinstatement. If denied reinstatement by the academic department, a student has the right to appeal to the Academic Standing Committee for continued enrollment in another department.

A student whose cumulative g.p.a. is deficient for two consecutive semesters is normally dropped. A student who feels there are important extenuating circumstances can appeal to the Office of Academic Standing. A student whose work is improving (semester g.p.a. of 2.00 or better), even though the cumulative g.p.a. is below a 2.00 for two semesters, is usually reinstated.

All students reinstated under any of the above provisions will be on academic probation and must abide by specific probationary conditions or be subject to denial of registration in succeeding semesters.

Decertification

Once certified, a student cannot be decertified by the department unless the student becomes academically deficient under Academic Regulations, Rules 37, 38, or 39. Students decertified under these rules must meet the approved additional criteria for recertification, if any.

Student Access to Education Records

The WSU regulations implementing the Family Educational Rights and Privacy Act of 1974 accord to students certain rights and privileges regarding education records. The regulations have been adopted pursuant to the Higher Education Administrative Procedures Act and are published as Chapter 504-21 of the Washington Administrative Code. Pursuant to this federal law, students are entitled to inspect their "educational records" maintained by university offices. The definition of "educational records" does not include materials used by any university instructor in the course of assessing a student's academic performance, nor materials compiled by the university counseling or health centers.

The law provides students with the right to inspect and review information contained in their education records, to challenge the contents of their education records, to have a hearing if the outcome of the challenge is unsatisfactory, and to submit explanatory statements for inclusion in their file if they feel the decision of the hearing panel will be unacceptable. Students may not inspect and review the following as outlined by the Act: financial information submitted by their parents; confidential letters and recommendations associated with admission including admission to the Nursing Program or College of Veterinary Medicine; employment or job placement, or honors to which they have waived their rights of inspection and control over education records containing information about more than one student, in which case the institution will permit access only to that part of the record which pertains to the inquiring student. Confidential letters and recommendations placed in the student's file prior to January 1, 1975, are not open for inspection.

Students who believe that their education records contain information that is inaccurate or misleading, or is otherwise in violation of their privacy or other rights, may discuss their problems informally with the university employee or office having custody of the particular record. If the decisions are in agreement with a student's request, the appropriate records will be amended. If not, the student will be notified within a reasonable period of time that the records will not be amended and he or she will be informed of his or her right to a formal hearing. Student requests for a formal hearing must be made in writing to the university employee or office having custody of the record in question. A student may present relevant evidence against the issues raised and may be assisted or represented at the hearings by one or more persons of his or her choice including attorneys, at the student's expense. The Student Records Committee shall be responsible for reviewing all formal requests for information and for advising the interdepartmental offices of relevant sections of regulations and policies that pertain to the Family Educational Rights and Privacy Act of 1974. The committee is also responsible for hearing appeals. The committee consists of the Registrar, a graduate student, an undergraduate student, two faculty members, and a representative of the Office of Student Affairs.

Students who believe that the adjudications of their challenges were unfair or not in keeping with provisions of the Act, may request, in writing, review by the Executive Vice President and Provost. Further, students who believe that their rights have been abridged may file complaints with the Family Educational Rights and Privacy Act Office, Department of Health
and Human Services, Washington, D.C. 20201. The complete text of this university policy is on file in the Offices of the Registrar, Student Affairs, and University Relations, and is published in the Washington Administrative Code.

The university reserves the right to verify dates of attendance and degrees and honors awarded.

Requirements for Graduation

A student who has (a) completed any of the four-year collegiate curricula, and (b) completed the General University Requirements for Graduation and any additional departmental or college requirements with a minimum 2.00 g.p.a., may become a candidate for the bachelor's degree, depending upon the field of study.

Application for a bachelor's or DVM degree should be made at the Registrar's Office near the end of the junior year and at least 60 days prior to the expected graduation date. A graduation application must be on file in the Registrar's Office before a student can graduate. A graduation fee must be paid at the time of application.

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 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 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.

A student who has completed any of the five-year curricula, has earned a minimum of 150 semester hours of credit, and has met the implied requirements in the paragraphs above may become a candidate for the bachelor's degree in that field of study.

Correspondence course credit is limited to not more than 25 percent of the total hours required for any undergraduate degree.

Students are required to do their senior work under the direction of the college in which the degree is to be granted. The degree granted and the schedule of studies for a given curriculum will be found in the material for the college or department concerned.

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

For otherwise qualified handicapped students, 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 a General University Requirement must be made directly to the Senior Petitions Committee and approved by the student's department chairperson and dean. Petition forms for GURs and college requirements are available in the Registrar's Office.

Catalog Options and Limitations

The graduation requirements of the university and its colleges 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. 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.

Undergraduates who will not graduate within the normal degree time frame (e.g., four years for a four-year baccalaureate program and five years for a five-year program) plus two years must meet the requirements for graduation as published in the Catalog four years prior to the date of graduation.

Official name changes in degree titles will go into effect automatically for all students after 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).

Departmental requirements for graduation (including those in a college which does not have separate departmental requirements) are those in effect at the time the student initially certifies the major. Changes in departmental requirements after certification will apply provided they do not require a student to enroll in more than a normal complement of credit hours in any semester or do not prolong the time required to complete degree requirements. Department and program chairpersons have authority to waive or provide substitute course work for departmental requirements.

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 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: (1) students may be encouraged to complete their requirements in similar or related degree tracks; (2) although General University Requirements (GURs) 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 Academic Regulation 114(5). 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 the WSU Bulletin or the Graduate Studies Bulletin.

General University Requirements for Graduation

General University Requirements for Graduation have been established by the University Faculty in the belief that all students should devote a significant portion of their academic efforts to general education. Students are encouraged to develop to the fullest their capacity for evaluating personal experience and for establishing a meaningful relationship to their natural and social environment. In addition, all educational development requires the ability to communicate effectively in both oral and written modes. Toward the attainment of these goals the faculty has established minimum requirements in the areas of Communication Proficiency, All and Humanities, Sciences, and Social Sciences. They have identified a wide selection of specific courses which, both by their content and method of instruction, contribute to the development of communications skills and general educational experiences. These courses are offered at both the lower- and upper-division levels. Students should seek the help of their faculty advisor to adapt course choices to their individual needs and interests.

The General University Requirements constitute a minimum experience asked of all students. The College of Sciences and Arts requires that students go beyond that minimum experience as a condition of graduation in that college.

General University Requirements for Graduation

Intercultural Studies (II), (G), (K)–3 hours

Arts and Humanities (G), (H), (R)–6 hours

Social Sciences (B), (K), (L), (U)–6 hours

Communication Proficiency (C)–6 hours including at least 3 in written communication (W)

Sciences (B), (P), (U), (Z)–10 hours including 1 credit for 3 clock hours of laboratory

Upper-Division (300-400-level)–40 semester hours

Hours and grade points—a minimum of 120 semester hours with a grade point average of 2.0 or better

Courses meeting specific GURs are listed below. No designated GUR course can be taken on a pass-fail basis. Courses in, or cross listed with, a student's major field may not be used to satisfy General University Requirements, except for the communication proficiency.

Students who have completed an approved Associate of Arts or Associate of Science degree at a Washington community college including
a course pattern which approximates the General University Requirements (GUR) for Graduation of Washington State University, as determined by the WSU Office of Admissions, will be considered to have fulfilled the General University Requirements.

**College of Sciences and Arts**

**Graduation Requirements**

These requirements include the General University Requirements for Graduation plus the additional requirements for students in the College of Sciences and Arts. (See list of courses below with GUR designations.)

**Arts and Humanities [G], [H] and Social Sciences [S], [K], [U]—21 hours**
- 6 hours Arts and Humanities (same as GURs)
- 6 hours Social Sciences (same as GURs)
- 9 additional hours in either Social Sciences or Humanities.

Students may use the 3 hour Intercultural Studies requirement as part of these 9 hours.

All courses must be outside the student's major department or program.

**Intercultural Studies [I], [G], [K]—3 hours (same as GURs)**

Students may use this 3 hour Intercultural Studies requirement as part of the 9 additional hours in Arts and Humanities, and Social Sciences.

All courses must be outside the student's major department or program.

**Communication Proficiency [C], [W]—6 hours including at least 3 in written communications (same as GURs)**

**Sciences [B], [P], [U], [Z]—12 hours**
- 12 hours from the list below with at least 3 in the Biological Sciences and 3 hours in the Physical Sciences and 2 hours credit for 6 clock hours of laboratory work. All courses must be outside the student's major department or program.

**Foreign Language**
- 1 year (2 semesters or 3 quarters) of one foreign language at the university level or 2 years of one foreign language at the high school level. Demonstrated proficiency by means of the Foreign Language Placement Examination may substitute for actual course work.

**Upper-Division (300-400-level)—40 semester hours**

**Hours and grade points—a minimum of 120 semester hours with a grade point average of 2.0 or better**

Transfer students holding an approved Associate of Arts or Associate of Science degree are responsible for the additional requirements of the College of Sciences and Arts.

**Courses That Meet General University Requirements for Graduation**

### H ARTS AND HUMANITIES

<table>
<thead>
<tr>
<th>Subject</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthropology</td>
<td>201, 355</td>
</tr>
<tr>
<td>Architecture</td>
<td>120, 121, 202</td>
</tr>
<tr>
<td>Asia</td>
<td>310[G], 373[G]</td>
</tr>
<tr>
<td>Asian/Pacific American Studies</td>
<td>311[G]</td>
</tr>
<tr>
<td>Classics</td>
<td>351</td>
</tr>
<tr>
<td>Communications</td>
<td>101</td>
</tr>
<tr>
<td>Drama</td>
<td>160, 365, 366</td>
</tr>
<tr>
<td>Fine Arts</td>
<td>101, 201, 202</td>
</tr>
<tr>
<td>Foreign Languages</td>
<td>310[G]</td>
</tr>
<tr>
<td>French</td>
<td>333, 334</td>
</tr>
<tr>
<td>German</td>
<td>334</td>
</tr>
<tr>
<td>Russian</td>
<td>317[G], 351[G]</td>
</tr>
<tr>
<td>History</td>
<td>101, 102, 340, 341, 342, 343, 360, 373[G]</td>
</tr>
<tr>
<td>Humanities</td>
<td>101, 103, 110, 111, 198, 202, 204, 310[G], 335</td>
</tr>
<tr>
<td>Interior Design</td>
<td>202</td>
</tr>
<tr>
<td>Landscape Architecture</td>
<td>202</td>
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<tr>
<td>Music</td>
<td>160, 265[G], 362, 364</td>
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<tr>
<td>Native American Studies</td>
<td>101[G], 265[G]</td>
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<tr>
<td>Philosophy</td>
<td>101, 107, 198, 201, 220, 306, 305, 310</td>
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<tr>
<td>Social Sciences</td>
<td>110, 111</td>
</tr>
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</table>

### S SOCIAL SCIENCES

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Agricultural Economics</td>
<td>201, 320</td>
</tr>
<tr>
<td>Agriculture and Liberal Arts</td>
<td>320</td>
</tr>
<tr>
<td>Anthropology</td>
<td>101, 198, 203, 303, 304, 309[K], 330</td>
</tr>
<tr>
<td>Asia</td>
<td>270[K], 275[K]</td>
</tr>
<tr>
<td>Asian/Pacific American Studies</td>
<td>201[K], 205, 275[K]</td>
</tr>
<tr>
<td>Black Studies</td>
<td>101</td>
</tr>
<tr>
<td>Chicano Studies</td>
<td>110[K]</td>
</tr>
<tr>
<td>Economics</td>
<td>102, 198, 201, 203</td>
</tr>
<tr>
<td>Environmental Science</td>
<td>101[U], 303[U]</td>
</tr>
<tr>
<td>Foreign Languages</td>
<td>270[K]</td>
</tr>
<tr>
<td>Forestry</td>
<td>303[U]</td>
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<tr>
<td>History</td>
<td>110, 111, 198, 201[K], 230, 231, 270[K], 275[K], 298, 308[K], 320, 381, 382</td>
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<td>Native American Studies</td>
<td>308[K]</td>
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<td>Political Science</td>
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<td>Psychology</td>
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<td>Sociology</td>
<td>101, 102, 198, 331, 350, 355</td>
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<td>Women Studies</td>
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</table>

### I INTERCULTURAL STUDIES

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<tr>
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<tr>
<td>Anthropology</td>
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<td>Asia</td>
<td>270[K], 275[K], 310[G], 314, 315, 373[G], 374</td>
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<tr>
<td>Asian/Pacific American Studies</td>
<td>201[K], 273[K], 311[G], 315</td>
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<td>Chicano Studies</td>
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<tr>
<td>English</td>
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<tr>
<td>Foreign Languages</td>
<td>270[K], 310[G]</td>
</tr>
<tr>
<td>Russian</td>
<td>317[G], 351[G]</td>
</tr>
<tr>
<td>Spanish</td>
<td>320</td>
</tr>
<tr>
<td>History</td>
<td>201[K], 270[K], 275[K], 308[K], 331, 373[G], 374</td>
</tr>
<tr>
<td>Humanities</td>
<td>310[G]</td>
</tr>
<tr>
<td>Music</td>
<td>265[G]</td>
</tr>
<tr>
<td>Native American Studies</td>
<td>101[G], 265[G], 308[K], 327, 331</td>
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<tr>
<td>Philosophy</td>
<td>314, 315</td>
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### C COMMUNICATION PROFICIENCY

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<th>Subject</th>
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<tbody>
<tr>
<td>Agriculture/Home Economics</td>
<td>205</td>
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<tr>
<td>History</td>
<td>300</td>
</tr>
<tr>
<td>Philosophy</td>
<td>102</td>
</tr>
<tr>
<td>Speech Communication</td>
<td>102, 235, 302, 324</td>
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### W WRITTEN COMMUNICATION PROFICIENCY

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<td>English</td>
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### B BIOLOGICAL SCIENCES

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<tr>
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<tr>
<td>Biological Science</td>
<td>101, 102[L], 103[L], 104[L], 105[L], 201, 298[L]</td>
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<tr>
<td>Botany</td>
<td>120[L]</td>
</tr>
<tr>
<td>Food Science/Human Nutrition</td>
<td>130</td>
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<tr>
<td>Genetics</td>
<td>201</td>
</tr>
<tr>
<td>Microbiology</td>
<td>101[L]</td>
</tr>
<tr>
<td>Zoology</td>
<td>205, 330</td>
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### P PHYSICAL SCIENCES

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<thead>
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<th>Subject</th>
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<tbody>
<tr>
<td>Astronomy</td>
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<tr>
<td>Chemistry</td>
<td>101[L], 102[L], 105[L], 106, 115[L], 116, 117[L], 298[L]</td>
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<tr>
<td>Geology</td>
<td>101[L], 102[L], 310[L]</td>
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<tr>
<td>Physics</td>
<td>101[L], 201[L], 380</td>
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### Z SCIENCES

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<tr>
<td>Environmental Science</td>
<td>101[U], 303[U]</td>
</tr>
<tr>
<td>Mathematics</td>
<td>303[U]</td>
</tr>
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</table>

1 Students who successfully complete foreign study programs in non-Western cultures under the auspices of the Washington State University Office of International Education or in institutions approved by the Office of Admissions, will have fulfilled the three hour GUR requirement in Intercultural Studies.
COLLEGE OF AGRICULTURE AND HOME ECONOMICS

J. L. Ozburn, Dean

The College of Agriculture and Home Economics is responsible for generating and disseminating knowledge to solve physical, biological, social, and economic problems related to agriculture and the family. These functions are carried out through instruction, research, and extension, all of which contribute to the development of the human and natural resources of the state of Washington.

Agriculture and home economics expertise is vital to the well-being of the state and nation. Agriculture is one of the most important industries in the state of Washington. The number of individuals involved in direct production agriculture has declined but the agricultural service sector provides increasing job opportunities. The rapidly changing social and economic environments have placed stress on individuals, families, and communities. Educational programs of the college prepare students to meet the challenges of agriculture and home economics.

The 13 agriculture and home economics teaching departments offer 25 majors that prepare professionals whose goals include improving the diet through efficient production, processing and distribution of food; and improving the health and well-being of individuals and families. The complexity of agriculture and home economics makes it imperative that students command knowledge about these fields. Also students receive a solid base of science and a technological grounding that enables graduates to remain abreast of the dynamic fields of agriculture and home economics.

Current programs in agriculture and home economics are not providing enough qualified personnel to meet industry demands for scientists, administrators, manufacturers, and sales personnel. Programs in agriculture prepare students for a wide variety of careers including food processing, pest management, finance, and sales and distribution of food products. Students who want to teach can become vocational agriculture teachers, extension educators, communications experts in newspaper, magazine, radio or television journalism. Scientific careers await in research, college teaching, and in highly technical pursuits in industry and government.

College programs in home economics prepare persons for positions as dietitians, parent educators, consumer and family management consultants, and directors of aging programs. Persons with appropriate majors enter fields of interior design, retail merchandising, consumer services, commercial food service, community health, and journalism. There are opportunities for graduates in teaching in junior and senior high schools, community colleges, and for work in cooperative extension and adult education, and administration and supervision of preschool and child care centers. Those who are granted master's degrees are educationally qualified to fill positions in research, cooperative extension, governmental agencies, foreign service, college teaching and business.

Admission

The requirements for admission to the College of Agriculture and Home Economics are the same as those for WSU. High school students planning to enroll in the college are urged to work closely with their counselor, and 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

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 who have completed two years before transferring may have some difficulty in completing requirements in two additional years because of required courses and course sequences. To avoid this difficulty, students enrolled in other colleges or universities but planning to transfer to the College of Agriculture and Home Economics at Washington State University should coordinate as much as possible on general university and departmental requirements normally scheduled during the freshman and sophomore years, with particular attention to those subjects required for the intended majors.

Requirements for Graduation

Requirements for graduation in the College of Agriculture and Home Economics vary according to the major and the degree to be granted as described in the component 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 University Requirements. Students are encouraged to do more than satisfy the minimum requirements.
Agriculture Degrees

Degree
Bachelor of Science in Agriculture
Bachelor of Science in Natural Resources Management

Master of Arts
Master of Adult and Continuing Education
Master of Regional Planning

Doctor of Philosophy

Department or Area
Adult and Youth Education, Plant Pathology

Majors

In Agriculture, the student has a choice of 19 undergraduate majors, six with separate curricula, and a choice of a minor in any of the departments.

Major
Agribusiness
Agricultural Communications
Agricultural Economics (including technical agriculture and general agricultural economics)
Agricultural Education
Agricultural Engineering
Agricultural Mechanization
Agronomy (including technical, business and industry, and science)
Animal Sciences (including general livestock, beef cattle and sheep, dairy cattle, horses, swine, poultry, meats, animal breeding, animal biology, animal nutrition, and animal physiology)
Entomology
Environmental Science
Food Science and Technology
Forest Management (including Wildland Recreation Management)
General Agriculture
Horticulture (includes fruit and vegetable production, ornamental horticulture)
Integrated Pest Management
Landscape Architecture
Plant Pathology
Plant Physiology

Degrees in Agriculture, including science, soil management, and soil inventory, are offered by the Department of Agriculture and Soil Sciences.

Range Management
Soils

Forestry and Range Management
Agronomy and Soils

degree and administration by College of Engineering and Architecture
accredited by Society of American Foresters
accredited by the American Society of Landscape Architects

Home Economics Degrees

Degree
Bachelor of Arts
Bachelor of Science in Home Economics
Master of Arts in Child and Family Studies
Master of Arts in Home Economics
Master of Science in Food Science
Master of Science in Home Economics
Doctor of Philosophy

Department or Area
Child and Family Studies, Clothing and Textiles, Interior Design
Food Science and Human Nutrition; Adult and Youth Education
Child and Family Studies
Clothing, Interior Design and Textiles
Food Science and Human Nutrition, Nutrition
Food Science and Human Nutrition
Food Science and Human Nutrition, Nutrition

Majors

In Home Economics, each department offers several major options as indicated below. Students may also select any of these options as minors. In addition, a minor in Aging is available through the Department of Child and Family Studies.

Major
Child and Family Studies (including child development, consumer studies, family studies, housing, preschool education)
Clothing and Textiles (including merchandising)
Home Economics Education
Human Nutrition and Foods

Department or Area
Child and Family Studies
Clothing, Interior Design, and Textiles
Food Science and Human Nutrition
Food Science and Human Nutrition

Dietetics—accredited by the American Dietetic Association
2 accredited by the Foundation for Interior Design Education Research

COLLEGE OF BUSINESS AND ECONOMICS

Rom J. Markin, Dean

The programs of the College of Business and Economics relate to instruction, research, and public service. The two principal objectives of these programs are (1) to promote an understanding of the business environment and (2) to educate students to deal with the complexities of that environment. The college offers courses of study leading to a variety of careers in the areas of business management, government, business and economics research, and the teaching of business and economics. Research efforts within the college are concerned largely with topics of interest to both the general populace and the business communities of the state of Washington and the nation. The results of this research are disseminated in the classroom, through publications, at business seminars, and at professional conferences.

The Business Development Program, advised by business leaders from throughout the state, provides a direct means by which the faculty and staff of the college can work with the business community to identify and to solve business problems.

Faculty members of the college make valuable contributions to the university and to their professional areas through teaching undergraduate
and graduate students; pursuing substantial research efforts; assuming leadership roles in regional and national professional organizations; and performing consulting activities in business, industry, and public administration agencies. These activities enhance the realism and relevance of the instructional programs within the college.

The long-term growth of economic activity in the state of Washington, the Pacific Northwest, and the nation generally has resulted in a strong demand for students who have completed the curricula offered by the College of Business and Economics. The growing complexity and sophistication of the business environment makes it increasingly imperative that today’s students understand the economic and business systems that surround them. Such an understanding is a vital prerequisite to more intelligent citizenship and good government. To be educated today, one must have a solid understanding of economic structures, business practices, business philosophies, and business institutions. The basic courses of the college are structured to give students an understanding of major problems in the business world and the economy; but more importantly, the instruction focuses upon the careful and systematic analysis of the problems of the business firm, the understanding and mastery of the management and decision-making processes, and the overall planning and control of business activity. The courses are also designed to foster an understanding of the chief problems of public policy in business and economic matters. The instructional programs are designed for students who eventually expect to become business executives, to assume research or management positions in private or governmental organizations, and to become teachers of business and economics. The close relationship between the business and economics programs within the college and the interdisciplinary cooperation with departments throughout the university provide carefully integrated educational experiences for students.

The curricula leading to degrees in business administration at both the graduate and undergraduate levels are accredited nationally by the American Assembly of Collegiate Schools of Business. Each major option embraces a core of courses that provides a common body of knowledge and advanced training in specific areas: the four business departments, Accounting and Business Law, Finance, Marketing, and Management and Systems, offer the following major specializations:

- Accounting
- Business Statistics and Data Processing
- Finance
- General Business
- Human Resources/Personnel
- Information Systems
- Insurance
- International Business
- Law and Public Policy
- Management
- Marketing
- Real Estate

Within the Department of Economics, students may specialize in such areas as:

- Econometrics
- Economic Development
- Economic History
- Economic Theory
- History of Economic Thought
- Industrial Organization and Government Regulation
- International Trade
- Labor Economics
- Mathematical Economics
- Money and Banking
- Public Finance and Taxation
- Transportation

Within the college a specialized degree is offered in the area of Hotel and Restaurant Administration.

To meet the demand for graduates with training in both business administration and one or more technical fields such as agriculture, chemistry, engineering, forestry, journalism and industrial psychology, special programs are available for persons with a bachelor of arts degree in the specialized field to earn a second bachelor of arts degree in business administration.

Graduate work may be taken in business administration and economics in most of the areas of specialization listed within these two major fields. All curricula in the College of Business and Economics are designed to fulfill two major objectives. The first is to develop students a broad understanding of the business system as a whole and an appreciation of that system in the cultural, economic, and political framework of society. The second is to enable students to pursue more intensive study in specialized areas during the latter part of their educational programs.

Admission Requirements

Admission requirements to the programs of the College of Business and Economics may vary. Requirements for specific programs are shown in the departmental section of this catalog. Interested students are advised to contact the departments for the latest requirements for major certification. Because of unusually high enrollments and limited space in classes, students may certify as business administration, economics, or hotel and restaurant administration majors only after earning a minimum of 40 semester hours, 6 of which must be in business or economics core courses, with a cumulative g.p.a. and business or economics g.p.a. which meet current standards determined by competitive ranking of students.

For exact information regarding the acceptability of professional courses taken at other institutions in areas of study offered by the departments of the College of Business and Economics, prospective students should communicate with the appropriate department chairperson or director.

Degrees

The curricula of the College of Business and Economics lead to the following degrees:

- Bachelor of Arts
- Master of Accounting
- Master of Arts
- Master of Business Administration
- Doctor of Philosophy

Department or Area

- Business Administration, Economics, Hotel and Restaurant Administration
- Accounting and Business Law
- Economics
- Business Administration
- Business Administration, Economics

COLLEGE OF EDUCATION

M. Stephen Lilly, Dean

The College of Education consists of the Departments of Counseling Psychology; Educational Administration and Supervision; Elementary and Secondary Education; and Physical Education, Sport, and Leisure Studies.

The College of Education prepares teachers for elementary school, secondary school, and college instruction; specialists in a variety of educational fields; administrators for schools, colleges, and universities; and sport and recreation specialists for private and community agencies. The college also provides professional training in physical education, recreation, athletic training, and counseling. It offers a variety of educational services to local school systems.

Teacher education is greatly strengthened by virtue of the program being in a multi-purpose university with a land-grant tradition. The college holds that people of courage, idealism, and intellectual promise, nurtured in the elements of disciplined liberal education and professional training, and imbued with respect for high standards of professional performance, will rise to the demands of new circumstances, exercising discriminating choice in the options before them. The college educates persons not only for adaptability but also for responsibility in making decisions.

The General University Requirements provide a foundation for professional work in the College of Education through offerings in the 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, field experience, and research preparation for leadership personnel in education and human services. Some certification programs are available at the graduate level. Doctoral programs focus on preparation of administrative personnel for the schools, counselors, teacher educators, and educational researchers. Graduate programs stress scholarship as a basis for all professional endeavors.

Teacher education curricula at all degree levels in the College of Education are accredited by the National Council for Accreditation of Teacher Education. The College of Education is a member of the American Association of Colleges for Teacher Education, the University Council on Education Administration, and the American Educational Research Association. State education agencies throughout the United States recognize and accept for certification purposes the professional work completed in the College of 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**

The undergraduate degrees offered in the College of Education are as follows:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Department or Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Arts in Education</td>
<td>Elementary and Secondary Education</td>
</tr>
<tr>
<td>Bachelor of Arts in Recreation and Leisure Studies</td>
<td>Physical Education, Sport, and Leisure Studies</td>
</tr>
<tr>
<td>Bachelor of Science in Physical Education</td>
<td>Physical Education, Sport, and Education</td>
</tr>
</tbody>
</table>

The graduate degrees offered by the College of Education are:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Areas of Specialization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master of Education</td>
<td>Administration, Counseling, Curriculum, Educational Psychology, Elementary Education, Higher Education, Reading/Language Arts, Secondary Education</td>
</tr>
<tr>
<td>Master of Arts in Education</td>
<td>Administration, Counseling, Curriculum, Educational Psychology, Elementary Education, Higher Education, Reading/Language Arts, Secondary Education</td>
</tr>
<tr>
<td>Master of Science in Physical Education, Sport, and Leisure Studies</td>
<td>Physical Education and Sport Studies, Recreation and Leisure Studies</td>
</tr>
<tr>
<td>Doctor of Education</td>
<td>Administration, Curriculum, Educational Psychology, Elementary Education, Higher Education, Reading/Language Arts</td>
</tr>
<tr>
<td>Doctor of Philosophy in Education</td>
<td>Administration, Counseling Psychology, Curriculum, Educational Psychology, Elementary Education, Higher Education, Reading/Language Arts</td>
</tr>
</tbody>
</table>

## COLLEGE OF ENGINEERING AND ARCHITECTURE

**Reid C. Miller, Dean**

The College of Engineering and Architecture has responsibilities for instruction, research, and public service in most fields of engineering and architecture. These responsibilities are carried out through a variety of activities. Included are formal classroom instruction at both the undergraduate and graduate levels and informal instruction which may take the form of seminars, individual directed studies, and counseling. The fundamental and applied research programs conducted by faculty and staff of the college provide engineering work opportunities for undergraduate students, for graduate student thesis research, and for services to the industries of the state. Research projects are designed to enhance the sound use of our material resources both economically and ecologically and to promote well-balanced industrial development. The collection and dissemination of technical information to industries and to the public in general is accomplished through short courses, symposia, and technical publications. To perform these varied functions, the College of Engineering and Architecture is organized into several degree-granting departments and research units. The faculty of the college participates in all three areas.

Engineering practice is based on a sound fundamental knowledge of chemistry, physics, and mathematics. Courses in engineering are designed to give thorough preparation in engineering sciences and in the solution of engineering problems. The following undergraduate curricula in the college are accredited by the Accreditation Board for Engineering and Technology (ABET): agricultural engineering, chemical engineering, civil engineering, electrical engineering, geological engineering, mechanical engineering, and materials science and engineering. The curriculum leading to Bachelor of Architecture is accredited by the National Architectural Accrediting Board (NAAB).

The professional engineer translates ideas, designs, and physical concepts into systems, processes, structures, machines and products. It is also the responsibility of the engineer and architect to consider the ethical, economic, and environmental impact of their activities on our culture and society.

It is the policy of the college to offer programs of such breadth that graduates may choose with confidence employment from the greatest possible number of specialities in their general field. The opportunity for specialization and training for higher-level performance is made available to qualified students in graduate programs in the various departments.

Majors in the College of Engineering and Architecture must include 15 to 18 credit hours in social sciences and humanities in their degree program including 3 credit hours in intercultural studies. Fifteen of the total hours must be selected from courses meeting the General University Requirements for Graduation. A student is encouraged to take from this group of courses that indicate a rationale in support of a professional education. Individual departments may require three credit hours in biological science. In architecture, the number of hours of architectural history help fulfill the humanities and social science requirement.

Students desiring special areas of study, combining various fields of engineering, or incorporating specialized areas outside the College of Engineering and Architecture, should consult the appropriate department chair or Associate Dean for Instruction of the college.

## Admission

Until prospective engineering majors have completed an engineering core of two semesters of calculus and either two semesters of chemistry or one semester of chemistry and one semester of physics, they will be assigned to an engineering adviser by the Curriculum Advisory Program (CAP).

Acceptance into a pre-engineering program is restricted due to enrollment limitations in specific degree programs. Admission into a program is based on a combination of factors including available resources, the student's overall grade point average, and grade point average in the core courses.

For those who are interested in pre-engineering in Mechanical, Electrical, or Computer Engineering, the overall grade point average and the grade point average in the courses mentioned above should be at least 2.5. Both core course and overall grade point averages must be at least 2.0 for those who are interested in pre-engineering in the other degree areas.

Upon completion of specific departmental requirements, qualified students may apply for admittance, on a space-available basis, to that department's professional program. Upper-division courses cannot be taken without professional admittance.

The deadlines for application for professional admittance are October 1 for spring semester and March 1 for summer and fall semesters. Students denied admittance into a professional program may appeal to the Associate Dean, College of Engineering and Architecture for a review to ensure that departmental procedures were followed.

In order to achieve normal progress in the engineering program, the student should have completed in high school a minimum of one year of chemistry, one year of physics, one year of biological science, and four years of mathematics. Lack of this background may lengthen the engineering program of study.

Many students complete the first two years of engineering study at one of the many community colleges in the state of Washington.

## The Doctor of Philosophy

The College of Engineering and Architecture offers programs of study and research in Engineering Science, Civil and Environmental Engineering, Chemical Engineering, Electrical and Computer Engineering, and Mechanical Engineering leading to the degree of Doctor of Philosophy. Admission is open to qualified students with a recognized degree in engineering, mathematics, a physical science, or a biological science.

Students wishing to specialize in agricultural engineering, atmospheric research, or materials science may do so through the Doctor of Philosophy in Engineering Science.

Additional information with regard to specific areas of active research may be obtained by contacting the Associate Dean for Research or the appropriate department chair.

Strong supporting work is available from the Departments of Mathematics, Physics, Chemistry, and General Biology. The program is also supported by many excellent university facilities such as the Water
Degrees

The curricula offered by the various departments of the College of Engineering and Architecture lead to the following degrees:

Degree

- Bachelor of Science
  - Department or Area

- Bachelor of Architecture
  - Architecture
  - Engineering (Spokane, Vancouver)

- Master of Engineering Management

- Master of Science
  - Architecture, Chemical Engineering, Civil Engineering, Electrical Engineering, Engineering, Environmental Engineering, Geological Engineering, Materials Science and Engineering, Mechanical Engineering

- Doctor of Philosophy
  - Engineering Science, Civil and Environmental Engineering, Chemical Engineering, Electrical and Computer Engineering, Mechanical Engineering

THE GRADUATE SCHOOL

Robert V. Smith, Dean

A 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 good of mankind. The fields of intellectual and scholarly activity are numerous, and the student who contemplates graduate study should select a graduate school that offers a superior program in the chosen field. The student should study the accomplishments of the members of the Graduate 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, so that they may 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 full-time graduate study, or the equivalent, is necessary for the completion of a program leading to a master’s degree. A doctor’s degree is awarded in recognition of distinctive scholarship. A candidate should expect to devote at least three years of full-time graduate work, or the equivalent, beyond a recognized bachelor's degree (two years beyond a recognized master's degree) in fulfilling the requirements for this 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, in many departments special attention is given to the preparation of students for careers in the teaching profession.

Except as they apply to undergraduate students only, graduate students are subject to the usual procedures and regulations of the institution and to such Graduate School rules and procedures as outlined on the following pages and in the Graduate Study Bulletin.

Organization and Administration

Opportunities for advanced study and research under members of the Graduate Faculty are offered in the Graduate School. 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 Graduate Studies Committee.

The Graduate Faculty 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 selected members of the faculty. Members of the Graduate Faculty have the responsibility of offering courses limited to graduate students, guiding graduate seminars, serving as thesis advisers and members of thesis committees, administering Graduate School Examinations, master’s, preliminary, and doctoral, and, from time to time, serving as members of the Graduate Studies Committee. Graduate students have opportunities for studying and working in a close professional relationship with the members of the Graduate Faculty who have been selected because of their special competence and interest.

Degrees Granted

Doctor of Philosophy

Programs leading to this degree are available in the following fields of study: agricultural economics, agronomy, American studies, animal sciences, anthropology, biochemistry, botany, business administration, chemical engineering, chemical physics, chemistry, civil engineering, computer science, economics, education, electrical and computer engineering, engineering science, English, entomology, food science, genetics and cell biology, geology, history, history, individual interdisciplinary studies, mathematics, mechanical engineering, microbiology, nutrition, pharmacology and toxicology, physical education, physics, plant pathology, plant physiology, political science, psychology, sociology, soils, veterinary science, zoology, and zoophysiology.

Doctor of Arts

The program of study leading to the degree Doctor of Arts is offered in individual interdisciplinary studies and the Department of Mathematics.

Master of Arts and Master of Science

The appropriate degree may be earned in most departments. (See the paragraph on degrees under the descriptive material for each department or other unit of the institution.)

Other Degrees

Courses of study leading to the Doctor of Education and Master of Education degrees are offered in the Department of Counseling Psychology, Elementary and Secondary Education, and Educational Administration and Supervision.

A student may undertake a program for the degree of Master of Fine Arts, Master of Business Administration, Master of Accounting, Master of Adult and Continuing Education, Master of Nursing, Master of Regional Planning, or Master of Engineering Management.

A program of study leading to the degree of Master of Arts in Teaching (MAT) is offered in speech.

Admission

Graduates of Washington State University and other colleges and universities whose degrees are recognized by this institution and who meet the requirements for admission to the Graduate School may be admitted to the Graduate School. For necessary 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 contemplate entering the Graduate School should obtain application forms from the Office of the Graduate School. Applicants for admission must have complete official transcripts of all prior college and university work sent directly from the Registrar of the institution at which the work was done to the Graduate School and to the major department. 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.

Students may be admitted to the Graduate School on regular student status if they have earned at least a B (3.00) average for the last half of undergraduate work. If admission is to be on the basis of graduate study elsewhere, it must have 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. 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. Such applications should be completed at least three months in advance of the proposed date of enrollment in the Graduate School. Foreign students who have undertaken graduate study in other institutions will be accepted only after evaluation of their undergraduate records, as well as their performance in graduate study and the minimum criteria as described above, will apply.

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. For further details the Graduate Study Bulletin should be consulted.

Transfer of Graduate Credits

Appropriate 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; however, they may not be substituted for residence requirements. For necessary interpretations, inquiries should be sent to the Dean of the Graduate School.

Summer Sessions

Credit earned during summer sessions of Washington State University may be applied in the same manner and subject to the same rules and regulations as credit earned during regular 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 Continuing Education

Credit earned in graduate level courses taken through the WSU Office of Continuing Education and Public Service will be accepted on graduate student programs without limit subject only to customary program approval.

No extension credits from other institutions, or work done by correspondence with this or any other institution, 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 half of their undergraduate work at Washington State University may register for up to six 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. 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 for undergraduate credit must obtain approval of the major adviser and the chair of the department or program in which the course is offered.

Registration

All graduate students must maintain continuous enrollment in the Graduate School, registering for each semester and summer session from the time of first enrollment until all requirements for the degree are completed. Continuous enrollment may be maintained by registering in one of the following categories: 1. Full-time enrollment; 2. Part-time enrollment; 3. Graduate leave status enrollment.

Students on graduate leave status may discontinue enrollment for credit for a period of 12 months without penalty. After that time, graduate leave status students will be assessed a fee of $15 a year for each year up to three that they have not enrolled for credit. Students on graduate leave status will be considered by the Graduate School to be in good standing for up to four consecutive years. Graduate leave status enrollees who wish to enroll for credit must give the Graduate School one month notice prior to the enrollment date. Graduate students who fail to maintain continuous enrollment will be dropped from the university.

Special Projects or Independent Study (600), Master's Research, Thesis, and/or Examination (700), Master's Special Problems, Directed Study, and/or Examination (702), and Doctoral Research, Dissertation, and/or Examination (800) shall have as prerequisite regular student status in the Graduate School.

Registration Policy for Graduate Students Completing Degree Requirements

Graduate students must register for the required amount of 700, 702, or 800 credit during the semester or summer session in which they take their final examination. 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 after the end of a term will be required to register for the following semester or summer session.

Scholarship 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 C 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.

Any graduate student who fails to maintain a cumulative grade point average of 3.00 or higher for all course work subsequent to admission to the Graduate School will be dropped from the university. A student who is dropped may be permitted to re-enroll if a special recommendation is made by the chair of the major department with the concurrence of the Dean of the Graduate School.

Requirements for a Graduate Degree

The graduation requirements of the Graduate School as published in the Graduate Study Bulletin in effect at the time of the student's initial admission as a regular or provisional graduate student are those which must be met for completion of a graduate degree program. Departmental requirements for graduation are those in effect at the time the student files a program.

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, by the department chair, and by 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 master's degree is six years from the beginning date of the earliest course applied toward the degree.

Each program for a doctor's degree is considered individually. In all cases, work for the degree must be completed within three years of the date of the satisfactory completion of the preliminary examination. At least four months must elapse between preliminary and final examinations for doctoral degrees.

Assistantships, Fellowships, and Scholarships

Teaching and research assistantships are available in most departments offering advanced degrees, and research fellowships are granted in some departments. For the student personnel program, staff assistants are appointed each year. The Graduate Study Bulletin should be consulted concerning qualifications, eligibility, and application procedures.

Assistantship appointments require part-time service. Students on appointment must maintain regular enrollment in Graduate School for the duration of their appointments. Stipends vary according to the amount of required service, the extent of the student's training, and other factors. Graduate students appointed to assistantships of one-half time service or more by the Board of Regents, and who reside in the state of Washington while attending WSU, are exempt from paying the resident operating fees and the non-resident portion of the tuition. Forms for assistantship or fellowship applications are included as part of the general application for admission to Graduate School.

As most appointments are made by April 1, it is desirable to have applications completed by March 15. 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 aid (such as a graduate scholarship, fellowship, traineeship, or assistantship) for the next academic year by an actual or prospective graduate student
completes an agreement which both student and graduate school expect to honor. In those instances in which the student accepts the offer before April 15 and subsequently desires to withdraw, 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 organizations subscribing to the above Resolution that a copy of this Resolution should accompany every scholarship, fellowship, traineeship, and assistantship offer.

For information about special scholarships and fellowships write to the Dean of the Graduate School or the chair of the department concerned.

Intercollegiate Center for Nursing Education
Thelma L. Cleveland, Dean

The Intercollegiate Center for Nursing Education (ICNE) in Spokane is a school of nursing shared in common by three institutions of higher education: Eastern Washington University, Washington State University, and Whitworth College. As such, the center reflects both the singular and the common purposes of its sponsoring institutions and serves as a model of collaborative educational endeavors. The nature of the consortium encourages an environment supportive of individual differences in students, faculty, and institutional emphases; broadens the resources available to the school of nursing; and provides a diversity of student backgrounds and experiences which stimulate and enhance learning. Through interinstitutional agreement, and consonant with its sense of evolving societal needs, the center focuses on improving the health care of the region, the nation, and the world community by preparing nurses through instructional programs, generating knowledge through research, and providing services in response to community needs.

Instructional programs are conducted at the baccalaureate and master's degree levels to develop responsible citizens and to provide the professional knowledge, skills, and values essential to the practice of nursing within the state and in the larger society. The undergraduate curriculum 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 and specialized practice and affords experience in conducting research. Faculty members, as an integral part of the instructional process, practice nursing and serve as models and mentors with small groups of students. The ICNE provides an environment conducive to intellectual curiosity and independent learning. Its programs of study accommodate individual differences and interests.

Undergraduate Program

ICNE's undergraduate program is approved by the Washington State Board of Nursing and is accredited by the National League for Nursing. Approximately 320 generic and registered nurse students are enrolled in the baccalaureate nursing program at Spokane and the outreach site in Yakima, Washington.

The program is open to students beginning a nursing career and registered nurses who wish to obtain a baccalaureate degree in nursing. Men and members of ethnic groups seeking a role in the health professions find that nursing provides a rewarding career. Members of these groups are actively recruited. Graduates practice in a variety of settings including hospitals, community health agencies, nursing homes, clinics, occupational health programs, home health care, and community mental health centers.

The curriculum in nursing consists of lower- and upper-division components and is four academic years in length. The length of the program for registered nurses varies depending upon previous education and the course load carried at the university.

The first two years of the curriculum (lower-division component) are completed on the Pullman campus or may be taken at any institution offering courses equivalent to those taught at Washington State University. The last two years of professional study (upper-division component) are provided at the Intercollegiate Center for Nursing Education in Spokane. In addition, the upper-division courses are offered in Yakima through the Office of Continuing Education and Public Service. Students are selectively admitted into the upper-division nursing major twice a year in Spokane and they are admitted once a year, fall term, in Yakima.

Admission

All students planning to major in nursing must apply to the Office of Admissions at WSU and be admitted to the university. Students are eligible to apply for entrance to the upper-division nursing major taught at the ICNE in Spokane upon successful completion of the first two years of required course work. These requirements may be met at WSU or may be transfer credits from another institution of higher education. Applications to the upper-division nursing major are obtained from the Office of Admissions at WSU. Applications must be completed by February 15 for fall admission and September 1 for spring admission. All students, both transfer and beginning, planning to enter the ICNE are advised to consult with the Lower Division Nursing Adviser, 236 Morrill Hall, Washington State University, Pullman, WA 99164-3524. Beginning students should seek consultation during the freshman year.

Admission to the Intercollegiate Center for Nursing Education is based upon the evaluation of the student's entire application, including academic record and basic mathematical proficiency. Applicants for admission to the center must present at least 60 semester hours or 90 quarter hours of acceptable credit from an accredited college or university. The credits must include those courses which are prerequisite to nursing. 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.

Graduate Program

Established in 1983, the Master of Nursing program prepares nurses for leadership positions in Nursing Service Administration, Nursing Education, and Advanced Nursing Practice: Adult Acute Care. The program is accredited by the National League for Nursing. Degree requirements, which include a thesis, can be completed in two years of full-time study. Individualized programs can be arranged to facilitate part-time study. Students may take elective courses at Eastern Washington University or Whitworth College without added tuition charges.

School Nurse Certification Program

The Eastern Washington School Nurse Certification Program is implemented through the ICNE. Applicants for the program must have a Bachelor of Science in Nursing degree.

Continuing Education Program

The Continuing Education Program provides a variety of offerings for Registered Nurses throughout eastern Washington. In addition to workshops, conferences, seminars, and courses conducted at more than eleven sites, televised courses are aired over cable and public television systems. The continuing education needs and interests of nurses are assessed through a variety of means.

Degrees

The degrees offered by the Intercollegiate Center for Nursing Education are as follows:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Science in Nursing</td>
<td>Generalized practice of professional nursing</td>
</tr>
<tr>
<td>Master of Nursing</td>
<td>Advanced Nursing Practice: Adult Acute Care, Nursing Education, Nursing Service Administration</td>
</tr>
</tbody>
</table>

COLLEGE OF PHARMACY

William L. Hayton, Acting Dean

The College of Pharmacy has as its objective the development of students for a lifetime of responsible service in the pharmaceutical profession. To achieve this goal, the professional curriculum is built upon a solid foundation of general sciences and mathematics and is integrated with courses in the humanities and social sciences. During the professional years of instruction, special attention is given to developing in students concern for the total health care of patients and the general public. The clinical pharmacy program on campus and in cooperating hospitals of the area emphasizes the role of the pharmacist in patient care both in institutions and in community practice. The preclinical basic science courses are carefully designed to prepare students for such experience. The College of Pharmacy is accredited by the American Council on Pharmaceutical Education and is a member of the American Association of Colleges of Pharmacy.
The curriculum of the College of Pharmacy is designed to prepare graduates for a variety of professional careers. A majority of pharmacists practice the profession in community pharmacies. Successful community pharmacists particularly enjoy meeting the public and looking after and advising individuals of their health needs. The hospital pharmacist is becoming an increasingly important person in the health-care team. The hospital pharmacist, as well as the community pharmacist, is accepting new responsibilities in assisting that patients receive the best possible drug therapy. Other pharmacists hold responsible positions in the manufacturing industry as production supervisors, researchers, and medical service representatives; in government positions; in teaching and institutional research.

The College of Pharmacy operates an active program for the recruitment of students with members of minority groups. Special programs of financial aid, academic advising and tutorial services are available for such students needing help.

Admission

The schedule of studies in pharmacy at Washington State University is divided into one prepharmacy or preprofessional year and four professional years.

The year of preprofessional studies may be taken at WSU, or at any accredited college or university having equivalent courses. Not less than 30 semester credit hours or 45 quarter credit hours should be completed during the preprofessional year; these should include courses equivalent to the WSU courses in the following list. Information concerning the acceptability of course credits may be obtained from the Office of Admissions.

WSU Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bio S 103, 104</td>
<td>8</td>
</tr>
<tr>
<td>Chem 105, 106</td>
<td>7</td>
</tr>
<tr>
<td>Chem 107 Qualitative</td>
<td>2</td>
</tr>
<tr>
<td>Math 140 Math for Life Scientists</td>
<td>4</td>
</tr>
<tr>
<td>Engl 101 Composition</td>
<td>3</td>
</tr>
<tr>
<td>Humanities or Social Science Electives</td>
<td>6</td>
</tr>
</tbody>
</table>

Students entering WSU as freshmen with an intent to major in pharmacy are advised to indicate this fact when enrolling as students in the Curriculum Advisory Program. Prepharmacy students are counseled and advised by members of the pharmacy faculty. In special cases a student who has completed all of the non-professional courses scheduled for the prepharmacy and first professional years of study may be admitted directly into the second professional year of study.

All students seeking admission to the College of Pharmacy, including WSU students as well as students from other institutions, must file an Application for Admission with Advanced Standing which may be obtained from and should be returned to the Office of Admissions during the period of December 1 to March 1. Students who wish to make special inquiries about the College of Pharmacy program should contact the Dean of the College.

Determination of admission to the College of Pharmacy will be based upon the student's academic record, test results, recommendations, and a personal interview. Students who may find it difficult to come to Pullman for an interview will be asked instead to provide three letters of recommendation. The race, sex, religion, age, color, creed, national or ethnic origin, marital status, and handicap of the applicant is not considered in the admission process. 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 preprofessional program will be admitted to the college.

A student applying for admission with advanced professional standing from another accredited pharmacy college must present evidence of good standing in the previous school and an acceptable cumulative grade point average and at least a 2.00 grade point average in pharmacy subjects. In addition, the student must present a letter of recommendation from the dean of the pharmacy college previously attended.

Degrees

The College of Pharmacy offers programs of study leading to the degree of Bachelor of Pharmacy, and it participates in an interdisciplinary graduate program offering the Master of Science and Doctor of Philosophy degrees in Pharmacology/Toxicology.

It is possible by special arrangement of courses and by careful selection of students for an acceptable for a Bachelor of Pharmacy degree to be concurrently a candidate for a Bachelor of Science degree. Such a student must fulfill the requirements of the second department as well as those of the College of Pharmacy.

COLLEGE OF SCIENCES AND ARTS

John Pierce, Acting Dean, Division of Humanities and Social Sciences
Robert Nilan, Dean, Division of Sciences

As a bearer of the tradition of liberal education, the College of Sciences and Arts places much importance upon soundly conceived and well-taught courses so developed as to give a properly balanced presentation of the basic areas of human endeavor. Students are assured a nucleus of courses in humanities, social sciences, biological sciences, and physical sciences, a knowledge of at least one foreign language, and a concentration of subject matter in the major and minor fields. As the interests of students develop, they are encouraged to supplement their programs with elective courses of special cultural values such as those in art, literature, and music.

The College of Sciences and Arts offers a number of programs that prepare students for various professions and vocations. Graduate as well as undergraduate work is offered by most departments.

Students who plan to do advanced work beyond the bachelor's degree should plan their programs to meet the requirements for admission to a graduate school.

The college has the responsibility to provide course work in the arts, humanities, sciences, and social sciences for students who major in the other colleges on the campus. In this respect, an important service function is fulfilled.

A number of curricula are offered to give preprofessional training to students who will then enter professional schools. At the same time these curricula are designed to provide a basic liberal education.

Washington State University is on the approved list of the American Chemical Society. The Department of Computer Science is a member of the national Computer Science Network (CSNET). The Geological Engineering curriculum is accredited by the Accreditation Board for Engineering and Technology. The graduate training program in clinical psychology is accredited by the American Psychological Association. The Speech Pathology program is accredited by the State Board of Education, and by the American Speech-Language-Hearing Association, Educational Standards Board. The Department of Music is a full member of the National Association of Schools of Music.

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

Admission

The requirements for admission to the College of Sciences and Arts are the same as those for Washington State University.

High school students should include the following subjects as preparation for work in the College of Sciences and Arts: at least four years of English, at least two years of one foreign language, two years of mathematics, two years of science, two years of social studies. Students interested in the biological, physical, or social sciences should have a third year of mathematics and a third year of science. For students interested in humanities, participation in music, art, speech, and communications is recommended.

Requirements for Graduation

The requirements for graduation include the General University Requirements for Graduation plus additional Sciences and Arts requirements in the humanities, social sciences and sciences. See graduation requirements on page 25 of this bulletin.

Departments and Programs

The College of Sciences and Arts is organized by departments and programs under two divisions.

The Division of Humanities and Social Sciences

Anthropology, communications, comparative American cultures, criminal justice, English, fine arts, foreign languages and literatures, history, music, philosophy, political science, psychology, sociology, and speech. In addition, several special curricula are offered and are listed alphabetically in this catalog as follows: aging, American studies, Asia, general studies (classics, humanities, social science, liberal arts, linguistics, religious studies), prelaw, social studies, social work, and women studies.

The Prelaw Advising Center is located in the Department of Political Science. Other prelaw curricula are offered through such departments and programs as English, history, philosophy, and classics.
The Division of Sciences

Basic medical sciences, biochemistry and biophysics, botany, chemistry, computer science, environmental science and regional planning, general biology, genetics and cell biology, geology, microbiology, pure and applied mathematics, physics, wildlife biology, and zoology. In addition, several special curricula are offered and are listed alphabetically in this catalog as follows: general studies (physical science, biological sciences, mathematics), chemical physics, geological engineering, physiology, premedical, statistics, and environmental science; several of these are offered jointly with other colleges of the university.

Degrees

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

Degree
Bachelor of Arts
Bachelor of Music
Bachelor of Science

<table>
<thead>
<tr>
<th>Department or Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Studies, Anthropology, Asian Studies, Black Studies, Chicano Studies, Communications, Criminal Justice, English, Fine Arts, Foreign Languages and Literatures, History, Humanities, Liberal Arts, Music, Philosophy, Political Science, Social Sciences, Social Studies, Sociology, Speech Music</td>
</tr>
<tr>
<td>Biochemistry, Biology, Chemistry, Computer Science, Environmental Science, General Studies (biological sciences, mathematics, physical sciences), Geological Engineering, Geology, Mathematics, Microbiology, Physics, Psychology, Wildlife and Wildland Recreation Management, Wildlife Biology, Zoology</td>
</tr>
<tr>
<td>Fine Arts</td>
</tr>
<tr>
<td>Regional Planning Biochemistry, Biology, Botany, Chemistry, Computer Science, Environmental Science, Genetics and Cell Biology, Geological Engineering, Geology, Mathematics, Microbiology, Physics, Plant Physiology, Psychology, Wildlife Biology, Zoology</td>
</tr>
<tr>
<td>American Studies, Anthropology, Biochemistry, Botany, Chemical Physics, Chemistry, Computer Science, English, Genetics and Cell Biology, Geology, History, Mathematics, Microbiology, Physics, Plant Physiology, Political Science, Psychology, Sociology, Zoology, Zoophysics Mathematics</td>
</tr>
</tbody>
</table>

The College of Veterinary Medicine is accredited by the American Veterinary Medical Association.

Admission

A minimum of six years is required to obtain the degree of Doctor of Veterinary Medicine. The first two years of preprofessional training can be taken at any institution having courses equivalent to those taught at Washington State University. Additional work must be taken at an accredited four-year institution and the last four years are professional study directed by the College of Veterinary Medicine.

Applicants for admission to the College of Veterinary Medicine must present at least 60 semester hours of acceptable credits from an accredited college or university exclusive of military training and physical education. The 60 semester hours should include: 6 semester hours of social science and 6 semester hours of humanities; 6 hours communication proficiency, 3 hours intercultural studies (general university requirements for graduation); 36 hours including zoology or general biology, inorganic and organic chemistry, biochemistry, physics, mathematics, genetics, and electives. All courses except biochemistry can be taken at a community college.

Information regarding the acceptability of course credits should be obtained from the Director of Admissions.

Courses designed to fit these requirements are offered by Washington State, and the number of students admitted to preprofessional work is not limited. Since the number of applicants for admission to the professional course exceeds the number that can be admitted, no assurance can be given that all applicants who successfully complete the preprofessional curriculum will be admitted.

A major in veterinary medicine is not declared until admission to the College of Veterinary Medicine has been granted.

Students seeking to enter the four-year professional program must fill out a "Uniform Undergraduate Application for Admission," as well as a WOJ Program application, both of which may be obtained from, and should be returned to, the Office of Student Services, College of Veterinary Medicine, Washington State University, Pullman, Washington, 99164-7001. These, plus a $25 application fee and two separate official transcripts from each college institution attended, should be filed with the Office of Student Services between August 1 and November 1 preceding the fall semester in which the applicant wishes to enroll. A transcript of the spring semester's credits must be in the Office of Student Services before July 1. The records of all qualified applicants are submitted to the WOJ Admissions Committee. The committee, with the approval of the Board of Regents, selects those students to be admitted to the first year of the professional program. Applicants will be notified of their acceptance or denial on or before April 15. 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:

1. To qualified students coming from homes in the states of Washington, Idaho, and Oregon.
2. To qualified students certified and financed by the WICHE Compact states.
3. To all other qualified students.

Western Regional Higher Education Compact

The College of Veterinary Medicine at Washington State University has entered into a regional educational program with the states of Alaska, Arizona, Hawaii, Montana, New Mexico, North Dakota, Utah, and Wyoming. Under the terms of this compact, a certified student admitted from one of these states is sponsored financially by the home state and is subject to the same fees as Washington resident students.

Students must apply to their home state for certification in addition to making application to the Director of Admissions, Washington State University. Additional information regarding regional veterinary education may be obtained from the following:

The Executive Director
Western Interstate Commission for Higher Education
P.O. Drawer P
Boulder, Colorado 80302

COLLEGE OF VETERINARY MEDICINE

Robert B. Wilson, Dean

The curriculum of the College of Veterinary Medicine prepares students for positions in the many fields of veterinary medicine, e.g., private practice, U.S. Public Health Service, federal and state disease regulatory programs, industry, teaching, research, and military medicine. Areas studied include animal health, disease eradication, comparative pharmacology and toxicology, environmental sciences, laboratory animal medicine, and comparative biomedical studies to help resolve human disease problems.

The professional degree, Doctor of Veterinary Medicine, is recognized by all state and territorial licensing boards, as well as those in foreign countries.

The College of Veterinary Medicine is accredited by the American Veterinary Medical Association.
WOI Regional Program in Veterinary Medical Education

Washington State University has agreed to engage in a regional program in veterinary medicine with the University of Idaho and Oregon State University. The regional program involves instruction on the WSU campus, at the Caldwell Station (Idaho), and on the Oregon State University campus. Specific quotas of students from Idaho and Oregon have been established under the terms of this agreement.

Degrees

The College of Veterinary Medicine offers courses of study leading to the degrees of Doctor of Veterinary Medicine, Bachelor of Science in Veterinary Science, Master of Science in Veterinary Science, and Doctor of Philosophy (Veterinary Science).

SOUTHWEST WASHINGTON JOINT CENTER FOR EDUCATION

George Condon, Director

The Southwest Washington Joint Center for Education in Vancouver offers programs from three Washington institutions. Washington State University provides graduate level and professional continuing education programs in engineering. Clark College offers two-year training programs for technicians, and pre-engineering and other transfer programs in technical areas. Clark College also cooperates with WSU in offering continuing education for area engineers, technicians, and managers. The Evergreen State College provides upper-division supporting course work and continuing education programs in community studies, health and human services, and management and the public interest.

WSU courses offered at the SWJCE in Vancouver are designed to accommodate the working professional who wishes to pursue an advanced degree or take graduate courses on a part-time basis. Programs leading to a Master of Science degree are available in the following areas of specialization: Computer Science, Electrical Engineering, Materials Science and Engineering, Engineering, and Mechanical Engineering. Also available are the Master of Business Administration, Master of Education, and Master of Engineering Management.

Admission

Persons interested in earning a Master's degree in Engineering are encouraged to make application to the WSU Graduate School. For more information about both graduate programs and professional continuing education, please contact:

Graduate Program Coordinator or
Continuing Education Program Coordinator
Southwest Washington Joint Center for Education
1800 E. McLoughlin Boulevard
Vancouver, WA 98663
(206) 699-0420

TRI-CITIES UNIVERSITY CENTER

Jerome W. Finnigan, Dean

The Tri-Cities University Center at Richland, Washington, is a multi-institutional education center administered jointly by Washington State University, the University of Washington, Central Washington University, and Eastern Washington University. Oregon State University also participates in the academic program. The center provides for these universities a means of delivering graduate and upper-division education to the Hanford area professionals, and to the public in the Tri-Cities region.

Through the center, with approval by the university, students can earn an advanced degree in biology, chemistry, civil engineering, computer science, education, electrical engineering, and materials science and engineering. The Department of Energy Hanford Laboratories are available for research purposes by individual arrangement and provide an exceptional opportunity to do research requiring facilities not available at most institutions of higher learning. Graduate and postdoctoral fellowships and faculty appointments are available for qualified persons who wish to do research at Richland. These are administered through the center.

Graduate students who plan to use course work and research undertaken through the center as a part of a program for a graduate degree at Washington State University must be admitted to the WSU Graduate School. Requirements and regulations are generally identical with those applicable to graduate students on the campus in Pullman.

Residence Requirements

Credit earned at the Tri-Cities University Center will be considered as Washington State University credit. Students who are candidates for the master's degree in programs sponsored by WSU listed above may petition the Dean of the Graduate School for permission to be excused from the residence requirement. Petitions for being excused from the residence requirements, which must be completed when applying for a degree, must be approved by the student's department chair and the sponsoring program coordinator prior to being presented to the Graduate School.

Requests for information concerning the activities and the programs of study and research at the center, availability of facilities, admission to activities, and for copies of the center's bulletin containing general information and course offerings should be addressed to: Dean, Tri-Cities University Center at Richland, Richland, Washington 99352.
Academic Departments, Courses, and Curricula

Curricula, courses, and degrees listed in this catalog are subject to change through normal academic channels. New proposals and changes are initiated by the cognizant departments or programs, approved through the appropriate academic dean, the Catalog Subcommittee, the Academic Affairs or Graduate Studies Committee, the Faculty Senate, and the Board of Regents. Additions to the curriculum for the ensuing year are published annually in the Catalog Supplement.

SYMBOLS

210 (101) indicates number change, the old number in parentheses.
3 number following course title indicates the hours of credit.
(2-3) numbers in parentheses following the credit hours indicate the contact hours of lecture, followed by laboratory, or studio hours required each week during a semester.
c// concurrent enrollment.
V 1-4 the letter “V” preceding the credit indicates the course is approved for variable credit within the semester.
[B] course partially meets a General University Requirement for Graduation, i.e., [B] biological sciences; [C] communication proficiency; [G] intercultural studies or humanities; [H] arts and humanities; [I] intercultural studies; [K] intercultural studies or social sciences; [P] physical sciences; [S] social sciences; [U] sciences or social sciences; [W] written communications; [Z] sciences.
(a/y) course is offered alternate years only.
(SS) course is offered during summer session only.

Department of Adult and Youth Education

Professor and Department Chair, C. L. Nelson; Professors, J. G. Cevnca, J. S. Long, T. F. Trail, R. J. Young; Associate Professors, R. M. Jimmerson, M. D. Kleene, M. M. Oaks, B. L. Trout; Assistant Professors, W. L. Holmes, B. J. Johnson, R. R. Murphy.

The Department of Adult and Youth Education offers six undergraduate majors: agricultural communications, agricultural education, general agriculture, general home economics, home economics education, and integrated pest management. In addition, preparation for international service is available.

The department offers courses of study leading to the degrees of Bachelor of Science in Agriculture, Bachelor of Science in Home Economics, Master of Adult and Continuing Education, and Master of Science in Vocational Technical Education.

Description of Courses

For explanation see Index under "Symbols"

General Agriculture and Home Economics

AgHE
199 Perspectives in Home Economics 2 Explores and integrates careers and curricula through field experiences; family units, life style, personal options; professional competencies.
205 [C] Human Relations in Agriculture and Home Economics 3 (2-3) Developing and understanding of human behavior and learning skills in communication and leadership.
305 Leadership Development in Agriculture and Home Economics 3 Prereq AgHE 205. Theories and principles of leadership; skill development and application of principles.
342 Methods of Teaching Agriculture 2 Prereq El/Se 301. For seniors. Curriculum development and instructional strategies for teaching agriculture.
343 Methods of Teaching Home Economics 3 Prereq El/Se 303 or c//; 18 hours H.E. Curriculum development and instructional strategies for teaching home economics.

345/346 (I Tec 345/346) Industrial Safety and Hygiene I Safety and industrial hygiene principles; federal and state regulations. Required for vocational certification.
403 Professional Perspectives 3 Prereq FSHN 130 or 233; CFS 240 or 247; I D 101 or 202. Interdisciplinary problem solving approach to individual and family issues, professional development in home economics specialization.
404 (443) Current Issues in Agriculture and Home Economics 3 Prereq AgHE 305, 404. Roles, skills, and relationships of individuals in the formation and implementation of policy in agriculture and home economics.
407 Directed Teaching, Agriculture and Home Economics 4 May be repeated for credit. Prereq AgHE 342 or 343, 434 or 442; c// in El/Se 405/406. By interview only. Supervised teaching in public schools for agricultural education and home economics education majors.
Department of Adult and Youth Education

434 Home Economics Education 2 Prereq q// in AgHE 343. Organization and administration of vocational programs in home economics.

440/441 (T Tec 440/441) Principles of Vocational Education 2 or 3 Prereq 9 hrs Educ. Local, state, and national vocational technical education legislation, policies, programs, and organizations.

442 Program Planning in Agricultural Education 2 Prereq AgHE 342. Organization and management of a total vocational agricultural program.

444 Rural Development in International Agriculture and Home Economics 3 Theory, principles, and rural development issues in international agriculture and home economics.

470 (T Tec 470) Directed Work Experience V 1-3 May be repeated for credit; cumulative maximum 6 hours. Job analysis and description; weekly work experience reports and analysis coordinated with problems related to the student's employment in an approved occupation.

471 Student Organizations 2 Role of student organizations; organization and implementation of leadership activities.

497 Agriculture/Home Economics Internship V 2-4 By interview only. Off-campus professional experience in agriculture and home economics industries.

499 Special Problems V 1-4 May be repeated for credit.

Continuing and Vocational Education

CVE

412 Management of Volunteer Programs 2 Theories and principles of adult development and learning as applied to management of volunteer programs.

413 Voluntary Boards of Directors and Advisory Committees 2 Theories and principles of adult and organizational development for staff who facilitate voluntary boards and advisory committees.

478 Career Development and Vocational Guidance for the Handicapped 3 Same as EdPsy 478.

501 (VTE 501) Seminar in Vocational Education V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq 6 hrs VTE. Joint course taught with the University of Idaho (VoEd 1D501).

504 (VTE 504) Special Topics in Vocational Education V 1-3 May be repeated for credit; cumulative maximum 6 hours.

507 (VTE 507) Foundations of Vocational Education 3 Historical, philosophical, social, and economic factors that influence education in vocational environments.

508 (ACE 508) Foundations of Continuing Education 3 Historical, philosophical, social, and economic factors that influence education in continuing adult and youth environments.

510 (ACE 510) Program and Curriculum Development in Continuing and Vocational Education 3 Planning, implementing, and evaluating programs and curricula for formal and nonformal education in continuing, extension, and vocational environments.

511 (ACE 511) Seminar in Continuing Education 1 or 2 May be repeated for credit.

514 (ACE 514) Learning Theory in Continuing and Vocational Education 3 Learning theories, principles and concepts that influence formal and nonformal education in continuing, extension, and vocational environments.

515 (VTE 515) Instructional Strategies in Continuing and Vocational Education 3 Instructional methods, techniques, and strategies uniquely applicable to formal and nonformal education in continuing, extension, and vocational environments.

516 (ACE 516) Research Methods in Continuing and Vocational Education 3 Rationalistic and naturalistic methods of research in formal and nonformal education.

521 Career Guidance for Youth and Adults 3 Guidance needs and objectives, principles, and practices; organization and use of occupational information.

525 (ACE 525) Foundations of Community Education 3 Same as Ed Ad 525.

526 (ACE 526) Community Education Resources for Problem Solving 3 Same as Ed Ad 526.

530 (ACE 530) Farming Systems Research and Development 3 Systematic theoretical framework for farming systems research and development projects using case studies.

531 (VTE 531) Special Topics in Agricultural Education V 1-3 May be repeated for credit; cumulative maximum 6 hours.

533 Special Topics in Continuing Education 3

534 (VTE 534) Special Topics in Home and Family Life V 1-3 May be repeated for credit; cumulative maximum 6 hours.

536 (VTE 536) Microcomputers in the Vocational Classroom: Implications and Applications 3 For experienced vocational classroom teachers who are initial microcomputer users. Indepth investigation into philosophical implications, education software, hardware, instructional strategies, curriculum planning and evaluation.

537 (ACE 535) Microcomputers for the Adult Educator: Implications for Adult Learning 3 For experienced adult educators who are initial microcomputer users. Philosophical implication, educational software, formal and informal instructional planning and evaluation.

540 (ACE 540) Farming Systems and the Family 3 Impacts of farming systems development on the farm family.

543 (VTE 543) Administration and Supervision in Continuing and Vocational Education 3 Theory and practice in the administration and supervision of formal and nonformal programs in continuing, extension, and vocational environments.

555 (VTE 555) Program Evaluation in Continuing and Vocational Education 3 Principles and procedures used in evaluating formal and nonformal educational programs in continuing, extension, and vocational environments.

586 (VTE 586) Management of Facility Planning 3 Same as Ed Ad 586.

597 Cooperative Education Programs 3 Program principles and design; teacher coordination procedures and responsibilities; classroom and on-the-job instruction; public relations; teacher administrative responsibilities.

598 (VTE 598) Internship V 1 (0-3) to 3 (0-9) May be repeated for credit; cumulative maximum 12 hours. Supervised experience in continuing, extension and/or vocational educational environments.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

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.

299 Pest Management Internship V 1-4 May be repeated for credit; cumulative maximum 7 hours. By interview only. Supervised individual practicum with IPM-oriented businesses, organizations, and governmental agencies; professionally related field interaction.

452 Pesticides and the Environment 2 Prereq 12 hrs Bio S. Immediate and prolonged effects of pesticides on man and other animals; legal and moral repercussions of pesticide use.

462 Systems of Integrated Pest Management 3 (2-3) Prereq Bio S 372a; IPM 201. Utilization of the systems approach in agricultural pest management; design, implementation, and analysis of IPM programs for selected crops. (a/y)

UNDERGRADUATE PROGRAMS

Schedule of Studies

AGRICULTURAL COMMUNICATIONS

A major in agricultural communications is offered in the Department of Adult and Youth Education, in cooperation with the Department of Communications, and leads to the degree of Bachelor of Science in Agriculture.

The student declaring this major must complete the requirements of the General Agriculture curriculum and earn a minimum of 30 hours in the Department of Communications, including any communications courses used to satisfy general agriculture requirements. Those electing this major should make that decision known as early as possible in their academic career.

Agricultural Communications majors should complete the following:

Print Media: Com 225; Jour 303; Com 233; P R 313, 413; Com 490, and 9 elective hours in the Department of Communications.

Broadcast Media: Com 165, 225, 255, 355, 365; P R 312, 413; Com 490, and 9 elective hours in the Department of Communications.

Recommended electives: The student should consult with a Department of Communications advisor before registering for elective courses.

Specialized programs patterned for individual career aspirations may be developed in conjunction with the head of the Department of Communications or a designated representative.

AGRICULTURAL EDUCATION

The agricultural education major prepares students to teach high school vocational agriculture. A minimum of 34 hours in agricultural sciences is required for graduation.

This course of study leads to the degree of Bachelor of Science in Agriculture. The program includes minimum requirements for both the Provisional Teaching Certificate and the Vocational Agriculture Education Certificate.
At least 40 of the total hours required for this degree must be in upper-division courses, with at least 20 hours in Agriculture. Students electing to major in Agricultural Education must complete at least 6 hours in Communications Proficiency, 6 hours in Arts and Humanities, 6 hours in Social Sciences, 3 hours in Mathematics (or show competency in mathematics), 8 hours in Physical Sciences, 31 hours in Education, 1 hour in safety education, and a First Aid Card. The program requires a minimum of 130 semester hours for graduation. Specific course requirements may be substituted with approval of the adviser. However, a minimum of 54 hours in agriculture science is required for Vocational Certification.

GENERAL AGRICULTURE

General agriculture is designed for students who wish to prepare for certain careers requiring broad training in agriculture. A maximum number of electives is permitted to enable the student to emphasize one or two fields, or otherwise to tailor the curriculum to fit particular needs.

Freshman Year

**First Semester**
- A S 101  
- Chem 101  
- Engl 101  
- Hort 101/201  
- Elective or Math 101  
- Hours  

**Second Semester**
- Ag EC 201  
- Chem 102  
- Hum Elective  
- Psych 105  
- Soils 201  
- Hours  

Sophomore Year

**First Semester**
- AgHE 205  
- Agron 101/201  
- Ag M 201  
- A S 213  
- Bio S 103  
- Hours  

**Second Semester**
- Ag EC 340  
- Elective  
- Ag M 203  
- Agron 250  
- Bio S 104  
- Hum Elective  
- Hours  

Junior Year

**First Semester**
- Ag M (upper division)  
- Ag EC 350  
- Ag/Se 301  
- IPM 201  
- Soils 301  
- AgHE 471  
- Hours  

**Second Semester**
- Ag (upper division)  
- Ag M 313  
- Ag Elective  
- Entom 340  
- Elective  
- Hours  

Senior Year

**First Semester**
- Ag M 402  
- Ag Elective  
- Ag/Se 403  
- First Aid Card  
- AgHE 342  
- Hours  

**Second Semester**
- Ag/Se 405/406  
- AgHE 442  
- AgHE 440  
- AgHE 345  
- AgHE 407  
- Hours  

Required Courses

- General University Requirements—38 hrs.
- Eng 101 Composition  
- Com Prof Elective  
- Arts and Hum Electives  
- Soc 101 Introduction  
- Psych 105 Introduction  
- Econ 201 Principles  
- Micro 101 Elem Bact  
- Chem 101 or 105  
- Zool 251 Intro Hum Physiol  
- Elective  

HOME ECONOMICS EDUCATION

The Home Economics Education major leads to the degree Bachelor of Science in Home Economics. The program meets the requirements for both the Initial Certificate and the Vocational Home and Family Life Education Certificate. At least 40 of the total hours required for the bachelor's degree in this major must be in upper-division courses. A minimum of 42 hours of home economics subject matter (CFS, CIDT, FSBN) are required for vocational certification.

Required Courses

- Eng 101 Composition  
- Com Prof Elective  
- Arts and Hum Electives  
- Soc 101 Introduction  
- Psych 105 Intro Psych  
- Econ 201 Principles  
- Micro 101 Elem Bact  
- Chem 101 or 105  
- Zool 251 Intro Hum Physiol  

GENERAL HOME ECONOMICS

The undergraduate major in general home economics is designed for students who wish to prepare for careers requiring broad training in the total field of home economics. A minimum of 60 semester hours of course work in child and family studies, clothing and textiles, interior design and human nutrition and foods is required. A maximum number of electives is permitted to enable the student to specialize in one or two fields such as business, communications, general science, social science or international development, or otherwise tailor the curriculum to fit particular needs.

Specific course requirements may be substituted with approval of the adviser. However, a minimum of 54 hours in agriculture science is required for Vocational Certification.
Required Courses (continued)

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>Engl 201</td>
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<tr>
<td>CPS 247 Family Relationships</td>
<td>3</td>
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<tr>
<td>CPS 240 Child Development</td>
<td>3</td>
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<tr>
<td>CPS 242 Directed Observation</td>
<td>1</td>
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<tr>
<td>CPS Elective</td>
<td>2-3</td>
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<tr>
<td>CPS 350 Decision Making</td>
<td>3</td>
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<td>CPS 353 Family Housing</td>
<td>3</td>
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<tr>
<td>CPS 450 Home Management</td>
<td>2</td>
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<tr>
<td>CPS 352 or 454</td>
<td>3</td>
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<tr>
<td>I D 101 Basic Environmental Design</td>
<td>3</td>
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<tr>
<td>C T 216 Textiles</td>
<td>3</td>
</tr>
<tr>
<td>C T 216 Cloth Construction</td>
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<tr>
<td>C T 217 Introduction to Clothing</td>
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<td>FSHN 120 or 220</td>
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<td>FSHN 130 or 333</td>
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<td>FSHN 266 Household Equip</td>
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<td>El/S 300 Intro Field Exp</td>
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<td>El/S 303 Secondary Schools</td>
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<td>AgHE 343 Teaching Home Ec</td>
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<td>El/S 402 Eval of Learn</td>
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<td>CoPsy 358 or 359</td>
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<td>AgHE 407 Directed Teaching</td>
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Option A (in addition to required courses above):
- Chem 101 or 106–4 hours; Chem 240–4 hours.

Option B (in addition to required courses above):
- Soc 270, 330, 331, 351, or Econ 312 or Anth 301–3 hours; social science elective–5 hours.

INTEGRATED PEST MANAGEMENT

The integrated pest management major is a multidisciplinary course of study sponsored by the Department of Agronomy and Soils, Entomology, Horticulture and Landscape Architecture, and Plant Pathology and coordinated through the Adult and Youth Education Department. 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. Students in this major have the option of obtaining a general background in pest management or specializing in one or both of the areas of entomology, and weed science within pest management. All students also participate in a summer internship program whereby they have the opportunity to gain work experience through supervised off-campus employment with pest management individuals or organizations.

All students are required to complete a minimum of 120 semester hours of course work, including the internship, to earn the Bachelor of Science degree in Agriculture. At least 40 of the total hours required must be in upper-division courses.

Freshman Year

First Semester Hours
- Bio S 103 Intro Biol 4
- Chem 101 or 105 4
- Engl 101 Composition 3
- IPM 201 Intro Pest Mgmt 2
- Hum Elective 3

Second Semester Hours
- AgHE 205 Human Rel 3
- Ag Econ 120 Econ Agric 4
- Agron 201 or Hort 201 4
- Env S 174 Intro Meteor 3
- Env S 101 Env Hum Life 4

Second Semester Hours
- Chem 240 Elem Org Chem 4
- Soils 201 3
- Hum Elective 3
- Elective/Option Course 3
- Intercultural Studies 3

Junior Year

First Semester Hours
- Agron 305 Weeds 3
- Stat 310 Ag Stat 3
- Bot 320 Intro Plant Phys 3
- PI P 429 Gen Plant Path 3
- Elective/Option Course 3

Second Semester Hours
- Bio S 372 Gen Ecol 4
- Bot 332 Intro Sys Bot 4
- Entom 340 Ag Entom 4
- IPM 452 Pesticides Env 2
- PI P 405 Dis WA Crops 2

Summer Session Hours
- IPM 399 Pest Mgt Intern 3

Senior Year

First Semester Hours
- Elective/Option Courses 15

Second Semester Hours
- Hort 417 Pht Pest Contr 3
- IPM 462 Sys Pest Mgmt 3
- Elective/Option Courses 9

Entomology Option. Students must take the above listed courses plus the following: Entom 343 instead of 340, 441, plus either 348, 443, 448, 450, or 480.

Weed Science Option. Students must take the above courses plus the following: Agron 302, 303, 445, and Soils 301.

INTERNATIONAL SERVICE

Many students want to work in international development. Excellent preparation is possible for temporary or interim assignments or for lifetime careers in serving as agriculturists, home economists, or educators overseas. Twenty semester hours chosen from the following list will, along with the General Agriculture and Home Economics curriculum, help prepare the student for international service.

AgHE 444, ACE 530, 540, Ag Ec 420; Anth 101, 203, 301; Micro 101; Econ 416, 470, 472; Env S 101; FSHN 130; GenCB 201; Geol 101; Pol S 102, 222, 423, 427; Psych 101, 102, 350; Soc 101, 270, 330, 371; For L elective.

GRADUATE PROGRAMS

Acceptance by the WSU Graduate School and three letters of recommendation supporting the applicant’s academic qualifications are required for entrance. The master’s degree candidate successfully completes a minimum of 30 semester hours of graduate credit, 26 of which are from graded courses, and a thesis or special problem. Twelve to fourteen of the graded hours are selected from “core” courses required of all students. Additional courses are selected in consultation with an adviser to meet the student’s professional goals. Optional non-graded internships may be arranged.

ADULT AND CONTINUING EDUCATION

The graduate program in Adult and Continuing Education is an interdisciplinary professional degree which utilizes resources and courses in the social sciences, natural sciences, home economics, agriculture, and education.

The ACE program is designed to prepare students for professional careers in the U.S. and abroad in (1) teaching adults, (2) administering and evaluating continuing education programs, and (3) conducting research.

Graduates are employed by community colleges and universities; local, state, and federal agencies; business and industry; and international development organizations. They work as teachers, administrators, coordinators, and specialists in such areas as adult basic education, community education, education, communications, agricultural extension, family living, community development, 4-H, and other human resource development programs in the U.S. and overseas.

VOCA TIONAL TECHNICAL EDUCATION

Graduate study is designed to prepare students for professional careers in vocational education administration, teaching, and research. All graduate students are required to complete a common core of courses and have the option of specializing in agriculture, home economics, or industrial technology education. Additional work in related fields may be taken in other WSU departments or through exchange courses with the University of Idaho.

Department of Aerospace Studies

Professor and Department Head, Colonel G. L. Thompson; Assistant Professors, Captain D. Antonelli, Captain G. Bentley, Captain D. Tut, Captain Y. Whittaker.

The Department of Aerospace Studies (Air Force ROTC) offers eligible students education and training which leads to a commission as a second lieutenant in the U.S. Air Force. Air Force ROTC students may major in any degree program offered at Washington State University. They supplement their major curriculum with the specialized Aerospace Studies courses in order to prepare for active commissioned service.

Students may participate in either the four-year program or two-year program. The four-year student completes the General Military Course (two years), four-week summer training (Aero 291), and the Professional Officer Course (two years). The two-year student attends a special six-week summer field training (Aero 292) and then completes the Professional Officer Course. The two-year program is designed for any student having two years left in the university, but who has no previous AFROTC or military service.
General Military Course (GMC). This sequence of courses consists of four one-credit courses normally taken during the freshman and sophomore years. The GMC sequence prepares the student for field training and the POC, and forms the basis for the four-year program. The sequence may be adapted to fit individual schedules.

Professional Officer Course (POC). This sequence, beginning with Aero 311, consists of four three-credit courses normally taken during the student's last two years in the university. Entry into the POC is competitive. Four-year students complete for entry during their last semester in the GMC. Other students interested in the two-year program should begin application by the end of the fall semester before they plan to enter the POC. Four- and two-year students selected for entry will be scheduled to attend Aero 291 or 292 during the summer before enrolling in Aero 311.

Financial Aid and Scholarships. Air Force ROTC offers enrolled GMC students the opportunity to compete for three-and-a-half, three, and two-and-one-half and two-year scholarships which pay tuition, fees, and approximately $100 each semester book allowance, as well as a $100 per month stipend during fall and spring semesters. Two-year program applicants can compete for a two-year scholarship. All Air Force ROTC students regularly enrolled in the POC receive the $100 per month stipend.

Description of Courses

For explanation see Index under "Symbols"

**General Military Course**

**Aero**

101 United States Aerospace Forces 1 (1-1) Structure and capabilities of the U.S. aerospace strategic and defensive forces; relationship of the individual to the Air Force.

102 United States Aerospace Forces 1 (1-1) Structure and capabilities of the U.S. aerospace general purpose and support forces; responsibilities and opportunities of the Air Force officer.

201 Evolution of Aerospace Power 1 (1-1) Growth and development of airpower, doctrine and concepts from the origins of manned flight through World War II.

202 Evolution of Aerospace Power 1 (1-1) Development of airpower, doctrine, concepts from the Berlin Airlift to today; peaceful employment of airpower as a force for stability.

**Field Training**

**Aero**

291 Four-Week Field Training Course 2 Prereq junior standing; Aero 101, 102, 201, 202. By interview only. Intensive study of military education, experience in leadership and management at an active Air Force installation. (SS)

292 Six-Week Field Training Course 6 Prereq junior standing. By interview only. Applicants must apply at least six months in advance. Intensive study of core course work and military education at an active Air Force installation. (SS)

**Professional Officer Course**

**Aero**

311 Air Force Leadership 3 (3-1) Prereq Aero 292 or 291. Professional leadership, responsibilities, and functions required of career Air Force officers; communicative skills.

312 Air Force Management 3 (3-1) Management principles and functions pertaining to command and supervision; case histories and case studies.

411 The Professional Military Officer 3 (3-1) Military officership as a profession, the role of national security forces in the U.S. and the military and the military.
Description of Courses

For explanation see Index under "Symbols"

Ag Ec

201 [S] Economics in Agriculture 3 General introduction to economics appropriate for production, consumption and ecological issues in the agricultural and rural sector of the economy.

210 Agricultural Information System 2 (1-3) Sources and interpretation of data used in agricultural economics; use of microcomputers to process, organize, and present economic information.


335 Legal Problems of Agriculture 3 An introduction to the nature and extent of common legal problems confronting Washington farmers and ranchers.

340 Introduction to Farm and Ranch Management 3 Prereq Ag Ec 201 or Econ 203. Appraisal, organization, and management of related types of farms and ranches.

350 Introduction to Agricultural Marketing 3 Prereq Ag Ec 201 or Econ 203. Problems of marketing farm products; functions and institutions surrounding market operations.

360 Introduction to Agribusiness Management 3 Prereq Ag Ec 201 or Econ 203. Product combinations, resource allocations, personnel, finance, and related problems in the operations of agribusiness firms.

361 Farm and Natural Resources Appraisal 3 Prereq Econ 102, 203; Ag Ec 340. Factors affecting value of land; valuation for loans, sales assessment, and condemnation. Field trips required. Cooperative course taught at the University of Idaho (Ag Ec ID361).

362 Co-operatives in the Agribusiness Industry 2 Prereq Acct 230. Organization, financing, management, and member relations in agricultural supply and marketing cooperatives.

370 Agricultural Prices 3 Prereq Ag Ec 201 or Econ 203; one statistics course. Factors determining levels and movements of prices in agricultural commodities.

408 Mathematics for Economists 3 Same as Math 408.

410 Applied Statistical Methods in Agricultural Economics 3 Prereq Math 201, 202; one statistics course. Application of sampling techniques, linear regression and analysis of variance and covariance to agricultural economics research problems.

411 Applied Operations Research Techniques in Agricultural Economics 3 Prereq Math 201, 202; one statistics course. Linear programming, transportation models, simulation, and inventory models.

420 International Agriculture and Economic Development 3 Prereq Ag Ec 201 or Econ 203. Nature and roles of agricultural development, trade and institutions.

422 Public Administration and Program Management in Developing Countries 3 Principles and procedures for direction and management of public sector activities in developing countries; case studies. (SS)

425 Economic Analysis of Projects and Policies 3 Prereq 300-level course in Econ or Ag Ec. Principles and procedures for evaluating projects and policies using cost-benefit analysis and related economic approaches. Credit not granted for both Ag Ec 425 and 525.

430 Financial Arrangements in Agriculture 3 Prereq Ag Ec 340; one accounting course. Personal and business finance in the agricultural economy, insurance, retirement, amortization and interest.

440 Advanced Farm and Ranch Management 3 Prereq Ag Ec 340. Economic principles applied to organization and operation of farms and ranches.

450 Advanced Agricultural Marketing 3 Prereq Ag Ec 350 or 370; Econ 301; one statistics course. Institutions, practices, policies, and problems in agricultural input and output marketing. Credit not granted for both Ag Ec 450 and 550.

453 International Marketing of Agricultural Products 3 Prereq Econ 203; I Bus 380. Application of economic theory and marketing techniques to the analysis of international agricultural trade.

460 Advanced Agribusiness Management 3 Prereq Ag Ec 360; Econ 301; one Acctg course. Alternatives in the market behavior of firms that handle, process, and trade in agricultural inputs and outputs.

480 Resource Economics 3 Prereq 300-level course in Econ or Ag Ec. Economic principles applied to natural resource problems; issues and policies.

490 Agricultural Policy 3 Prereq Ag Ec 201 or Econ 203. Public policy issues related to commercial agriculture and rural areas.

497 Agribusiness Internship V 1-4 May be repeated for credit. By interview only. Off-campus work-study in the agribusiness industry. (SS)

511 Seminar 1 May be repeated for credit. For Seniors. Current problems.

520 Economics of Public Choice in Agriculture and Natural Resources 3 Prereq Econ 401, 501. Basic concepts of economics of public choice and their application to public policy in agriculture, rural areas and natural resources.


511 Linear and Nonlinear Programming in Agricultural Economics 3 Prereq Ag Ec 408, 411. Mathematical programming applications of duality, parametric programming, inverse matrix methods, transportation problems, game theory, quadratic, integer, separable, and dynamic programming.

520 Model Construction and Experiments 3 Prereq Ag Ec 408, 510. Model construction and experiments for analysis of agricultural supply and demand problems.

520 Economic Development and Trade in Agriculture 3 Nature and roles of agricultural development and trade; concepts of sectors, regions, and interregional relationships. (a/y)

521 Seminar in Agricultural Economics 1-3 May be repeated for credit. Cumulative maximum 6 hours. Current topics in agricultural development, marketing, farm management, and agricultural policy.

525 Economic Analysis of Projects and Policies 3 Graduate level counterpart of Ag Ec 425; additional requirements. Credit not granted for both Ag Ec 425 and 525.


541 Advanced Agricultural Production Economics 3 Prereq Ag Ec 408, 540. Current risk decision theory and duality in production economics theory applied to agricultural policy and managerial problems. (a/y)

550 Advanced Agricultural Marketing 3 Graduate level counterpart of Ag Ec 450; additional requirements. Credit not granted for both Ag Ec 450 and 550.

551 Marketing Organization and Structure 3 Prereq Ag Ec 450 or 550. Analysis of marketing research tools and applications; theoretical concepts of marketing as modified by cultural, institutional, and economic systems. (a/y)

580 Advanced Resource Economics 3 Prereq Econ 501. Economic analysis of the allocation and use of environmental and natural resources.

581 Advanced Topics in Resource Economics 3 Prereq Ag Ec 580. Theoretical underpinnings of advanced topics in resource economics. (a/y)

590 Public Policy and Agriculture 3 Agriculture's role in the public economic policy. (a/y)

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

General Department Requirements

The following schedules set forth the general requirements for the two Bachelor of Science degrees: Bachelor of Science in Agricultural Economics and Bachelor of Science in Agribusiness. Under the agricultural economics degree there are three options: management, general and technical. General University Requirements are met in the department requirements listed for all curricula. Students should consult their advisers for the appropriate sequencing of courses as well as for the selection of electives that best suit their needs and interests. Illustrative programs are available from the department. At least 40 of the total hours required for the bachelor's degree in these programs must be in upper-division courses.

BACHELOR OF SCIENCE IN AGRICULTURAL ECONOMICS

Management Option

This option permits in-depth study into management and decision-making tools, while retaining the flexibility to permit an integrated complement of courses to fulfill an individual student's needs. It provides good farm management preparation. Students may take agribusiness courses under this option but are encouraged to pursue a Bachelor of Science in Agribusiness if they seek specialized training in that area.
Requirements
6 hours from Ag Ec 340, 350, 360; 3 hours from Ag Ec 440, 450, 460 that follow the 300-level choice; 3 hours from Ag Ec 410, 411, 430; 3 hours from 400-level; 6 hours from 300-level or above
Ag Ec 335 or B Law 210
QMath 215, Biom 310, or Biom 412
QMath, Stat or Cpt S elective, or Ag Ec 410, 411
Acctg 230, 231
Junior-level accounting or Cpt S 150 and 151, 152, 153, or 154
Econ 102, 203, 301, and 320 or 340
Engl 101 and 402
SpCom 102, 235, 302, or 330
Communications skills elective
Hum and Soc S (one from Mgt 301, Psych 306, 307, and 3 hours of 200-level of above)**
Bio S and Ph S electives (include 1 hour credit for lab)**
Math 201 and 202
Production ag elective, excluding Ag Ec
Intercultural Studies
Total Hours Specified
Other Electives
102
18

*May not include Econ, but must meet the 6 hours General University Requirements in Arts and Humanities.
**In addition to Math 201.

General Option
This option permits the student to obtain both breadth and depth in agricultural economics with a high degree of specialization in any one field. However, the program does have sufficient flexibility to permit the student to emphasize special interest areas such as policy, resource economics, development, or marketing. Although the Bachelor of Science in Agribusiness or any one of the three curricula offered under the agricultural economics degree will prepare the student for graduate work in agricultural economics, this program is especially well-suited for that purpose.

Requirements
Ag Ec: 9 hours from 340, 350, 360, 440, 450, 460, six of which must be in the same sequence; 410 or 411; 6 hours 300 or above elective; 6 hours 400-level electives
QMath 215, Biom 310, or Biom 412
QMath, Stat, or Cpt S elective or Ag Ec 410, 411
Acctg 230
Econ 102, 203, 301, 320 or 340, 401 or 402
Production ag electives, excluding Ag Ec
Engl 101 and 402
SpCom 102, 235, 302 or 330
Communication skills elective
Hum and Soc S (9 hours must be 200-level or above)*
Bio S and Ph S (include 1 hour credit for lab)**

QMeth 215, Ag Ec 411, Cpt S elective
Engl 101 and 402
SpCom 102, 235, 302 or 330
Communications skills elective
Hum, Soc S, and Intercultural Studies to meet General University Requirements 6 hours [H], 6 hours [S], and 3 hours [I] (6 hours must be 200-level or above)*
Bio S and Ph S (include 1 hour for lab credit)**
Math 201 and 202
Total Hours Specified
116

*May not include Econ, but must meet 6 hours General University Requirement in Arts and Humanities.
**Students must meet the 10 hours General University Requirements in the Bio S and Ph S fields and may substitute appropriate math courses in this requirement.

Minor in Agricultural Economics
A minor is offered in agricultural economics which requires that a student complete 16 hours of course work in the department of which 12 hours must be in upper-division courses. Students must also complete one of four junior-senior program sequences, e.g., farm management, marketing, agribusiness management or resource economics. Students wishing to declare a minor should consult with an adviser as early as possible to develop the required program.

Transfer Students
Students planning to transfer to Washington State University from other institutions should take courses which will meet the 100- and 200-level course requirements in economics, accounting, English, speech, and General University Requirements in the natural and social sciences. All students planning to major in agricultural economics are encouraged to take intermediate algebra prior to entering Washington State University.

Preparation for Graduate Study
Students who plan to do work in agricultural economics beyond the bachelor's degree should consult their advisers as early as possible to develop a study program directed toward their goals.

BACHELOR OF SCIENCE IN AGRIBUSINESS

The Bachelor of Science in Agribusiness degree has been developed for the student who wants to specialize in agribusiness management. Emphasis is placed on the principles of management, marketing, and finance as they apply to the agribusiness sector. The program requires in-depth inquiry into the various management, marketing, and financial decision-making tools. Enough flexibility exists to permit an integrated complement of courses.

Requirements
Ag Ec 201, 340, 360, 370, 450, 460, 430
300-level electives
400-level electives
Econ 102, 301, 320
Acctg 230, 231
Mgt 301, Mktg 360, B Law 210
300-level Acctg or 400-level Mgt or Mktg
Production ag electives, excluding Ag Ec (6 hours must be in one department)

Total Hours Specified
97

*May not include Econ, but must meet the 6 hours General University Requirements in Arts and Humanities.
**Students must meet the 10 hours General University Requirements in the Bio S and Ph S fields and may substitute appropriate math courses in this requirement.

Department of Agricultural Engineering

Professor and Chair, L. G. King; Professors, J. E. George, R. E. Hermanson, A. E. Powell (Emeritus), H. Waelti; Associate Professors, D. L. Bassett, D. C. Davis, R. G. Evans, G. M. Hyde, L. G. James, D. K. McCool, K. E. Saxton, J. B. Simpson, D. E. Wilkins; Assistant Professors, R. P. Cavalieri, T. W. Ley, M. J. Pitts, W. B. Symons.

AGRICULTURAL ENGINEERING

Agricultural engineering is the application of engineering science to agriculture. Basic knowledge from almost all fields of engineering is utilized and the whole of agriculture is encompassed. Agricultural engineers may become involved in any of the many activities necessary for or in support
of the production, processing, storage, transportation, and marketing of agricultural commodities. Agricultural engineers also make significant contributions to society by preparing designs and management plans for protecting precious water, soil, and energy resources. The demand is strong for agricultural engineering graduates in a variety of employment opportunities. Many graduates are employed as design or development engineers for private industries or governmental agencies. Others seek self-employment in farming, consulting, or other agriculturally oriented enterprises or enter graduate school to pursue advanced degrees. There are many opportunities available to agricultural engineers for rewarding careers overseas.

The curriculum leading to the Bachelor of Science degree in Agricultural Engineering is accredited by the Accreditation Board for Engineering and Technology. The Department of Agricultural Engineering also participates in the College of Engineering and Architecture programs leading to the degrees of Master of Science in Engineering and Doctor of Philosophy (Engineering Sciences). Undergraduate students must apply to the department for certification of agricultural engineering as a major. Deadlines for receipt of applications are November 15 for spring semester and April 15 for summer and fall semester. Criteria for selection majors include P.A., normal progress, and number of repeat. Details are available in the departmental office.

Description of Courses

For explanation see Index under "Symbols"

Ag E 110 Introduction to Agricultural Engineering 1 (0-3) For freshmen. Introduction to engineering design and agricultural engineering as a profession.

341 Hydrology 3 Precipitation and runoff events; principles of climatology, evaporation, infiltration, and snowmelt. Cooperative course taught at the University of Idaho (AgE ID 513).

354 Agricultural Engineering Analysis 3 (3-3) Prereq Cpt S 203. Analysis of physical and biological systems by digital computer methods.

362 Agricultural Power and Machinery 4 (3-3) Prereq M E 301 or c/. Performance, operation, and testing of agricultural power units and machinery; functional requirements, materials, forces and safety. Joint listing with the University of Idaho (AgE ID 374).

380 Farm Electrification Engineering 2 (1-3) Prereq E E 304, 305. Electric power in agriculture; AC power, power distribution, electrical wiring, electric motors and controls.

385 Agricultural Processing and Environment 3 Prereq Ag E 354, C E 315, M E 301 or c/. Materials handling and processing, psychrometrics, heat and mass transfer, pumps and fans, refrigeration, agricultural environments, waste management.

386 Engineering Properties of Agricultural Materials 2 Prereq Chem 105; Bio S 103; C E 314; Ag E 385. Composition of agricultural materials, mechanical and thermal properties, chemical and biological changes.

390 Introduction to Soil and Water Engineering 2 (1-3) Prereq Soils 201; C E 351. Fundamentals of soil and water engineering; agricultural hydrology and hydraulics, erosion control, and water quality.

451 Seminar 1 May be repeated for credit; cumulative maximum 2 hours. Prereq junior or senior. Readings and interviews, research, and oral presentation of professional subjects.

455 Agricultural Engineering Design 1 1 (0-3) Prereq senior in Engr. Designation of background information for design; selection and evaluation of design concepts.

456 Agricultural Engineering Design 1 1 (1-6) Prereq Ag E 455. Continuation of Ag E 455. Detailed design of an agricultural engineering-related process, machine, structure, or system.

471 Farm Structures Design 3 Prereq C E 314. Engineering analysis and practice applied to concrete foundations and structural design in wood and steel for farm buildings.


482 Microcomputer Controls in Agriculture 2 (3-2) Prereq Cpt S 203; Ag E 380. Microcomputer-based control systems with agricultural applications. Credit not granted for both Ag E 482 and 582.

485 Environmental Systems Design 3 Prereq Math 172. Systems engineering approach to design of livestock production, crop processing, and storage facilities. Credit not granted for both Ag E 485 and 585. Cooperative course taught at the University of Idaho (AgE ID 449).

487 Food Process Engineering 3 Prereq Ag E 386, Ch E 330, or FSHN 433. Design of food processing systems; food properties; thermal and physical processes. Credit not granted for both Ag E 487 and 587.

491 Irrigation Engineering 3 (2-3) Prereq Ag E 354, 360. Theory and design of gravity, sprinkler, and trickle irrigation systems; water requirements and sources; efficient use of water and energy. Credit not granted for both Ag E 491 and 591.

495 Internship in Agricultural Engineering V 1-3 May be repeated for credit; cumulative maximum 6 hours. Open to freshman. Prior approval of supervisor and advisor required. Work experience related to academic learning.

496 Conservation Engineering 3 (3-3) Prereq Ag E 354, 390. Predicting occurrence and disposition of water on agricultural watersheds, hydrologic modeling; erosion processes; control structures and methods; construction practices. Credit not granted for both Ag E 496 and 596.

499 Special Problems V 1-4 May be repeated for credit.

551 Advanced Agricultural Engineering Topics 1-4 May be repeated for credit; cumulative maximum 6 hours. Directed group study of selected advanced topics in agricultural engineering.

555 Natural Channel Flow 3 Prereq C E 451. Hydrodynamics of non-uniform flow in irregular channels; steady state flow; flow routing; sediment transport and density currents. Cooperative course taught at the University of Idaho (AgE ID 555).

585 Fluid Mechanics of Porous Materials 3 Prereq Math 273. Statics and dynamics of multi-flow systems in porous materials, properties of porous materials; steady and unsteady flow. Cooperative course taught at the University of Idaho (AgE ID 555).

582 Microcomputer Controls in Agriculture 3 (2-3) Graduate level counterpart of Ag E 482; additional requirements. Credit not granted for both Ag E 482 and 582.

584 Instrumentation and Measurements 3 (2-3) Prereq Math 172; Phys 102 or 202. Instrumentation systems and measurement concepts, electronic signal-conditioning components and circuitry, digital electronics and microprocessor basics.

585 Environmental Systems Design 3 Graduate level counterpart of Ag E 485; additional requirements. Credit not granted for both Ag E 485 and 585. Cooperative course taught at the University of Idaho (AgE ID 569).

587 Food Process Engineering 3 Graduate level counterpart of Ag E 487; additional requirements. Credit not granted for both Ag E 487 and 387.

590 Advanced Theory of Irrigation Water Requirements 1 Energy balance and consumptive use of water; influence on farm and project irrigation system design criteria, management, and efficiencies.

591 Irrigation Engineering 3 (2-3) Graduate level counterpart of Ag E 491; additional requirements. Credit not granted for both Ag E 491 and 591.

592 Advanced Theory and Design of Irrigation Systems 3 (3-3) Prereq Ag E 491/591. Design and development of irrigation water application systems. (a/y)

593 Drainage Engineering 3 (3-3) Prereq Soils 201; C E 315 or Ag M 344. Engineering principles applied to solution of subsurface drainage problems: investigation, design, materials, and construction of drainage systems.

596 Conservation Engineering 3 (3-2) Graduate level counterpart of Ag E 496; additional requirements. Credit not granted for both Ag E 496 and 596.

598 Graduate Seminar 1 May be repeated for credit. Required of all graduate students in agricultural engineering.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit. (For PhD in engineering science only.)

Schedule of Studies

The Bachelor of Science degree in Agricultural Engineering requires a total of 124 semester hours. At least 45 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

Freshman Year

First Semester            Hours
Ag E 110 Intro Ag E 1
Ag E 304 Plant Sci 3
Chem 101 Calculus I 4
Chem 102 Prin of Chemistry 4

Second Semester            Hours
Ag E 110 Intro Ag E 1
Ag E 304 Plant Sci 3
Chem 101 Calculus I 4
Chem 102 Prin of Chemistry 4

Total: 74 hours
Sophomore Year

First Semester
Cpt S 203 Cpt Prog for Engrs 2
C E 211 Statics 3
Phys 201 Classical Physics 4
Intericultural Studies Elective (GUR) 3
Soils 201 Soils 3
Math 273 Calculus III 2

Second Semester
Phys 202 Classical Physics 4
Math 315 Diff Equations 3
C E 212 Dynamics 2
Ag E 354 Ag Engr Analysis 3
Engl 402 Report Writing 3

Junior Year

First Semester
C E 314 Mech of Materials 3
C E 315 Mech of Fluids 3
M E 301 Fund of Thermodynamics 3
Ag E 385 Ag Proc & Env 3
Arts & Hum (GUR) 3
Ag E 451 Seminar 1

Second Semester
Ag E 386 Prop of Ag Matls 2
Ag E 362 Prin of Farm Mach 2
Ag E 390 Soil & Water Engr 2
C E 331 Hydraulic Engr 3
E E 304 Intro Elect Circ 2
E E 305 Intro Microproc 2
Ch E 441 Proc Control 3

Senior Year

First Semester
Ag E 455 Ag Engr Design I 1
C E 463 Engr Admin 3
Ag E 487 Food Proc Engr 3
Ag E 491 Irrigation Engr 3
Approved Stat Elec 3
Ag E 380 Farm Electrification 2
C E 480 Prof Asp of Engr 1

Second Semester
Ag E 456 Ag Engr Design II 3
Ag Elective 3
Engr Design Elective 3
Engr or Sci Elective 3
Ag, Sci, or Engr Elective 3

Transfer Students

Students who plan to transfer to Agricultural Engineering at Washington State University from other institutions should coordinate their programs early with the Department Chair to select courses that will be applicable to degree requirements. A strong preparation in mathematics and physics, and proper selection of electives will minimize the time required to complete bachelor’s degree requirements.

AGRICULTURAL MECHANIZATION

The Department of Agricultural Engineering prepares students in agricultural mechanization for the application of technology to operations or management in agriculture. The areas of application are: mechanized farming, services, management of agriculturally-oriented businesses, sales, and promotional work in agricultural communities.

Emphasis is placed upon the practical application of technology to agricultural enterprises methods. This prepares students to own, operate, and manage their own enterprise or provide services for private or governmental entities.

A wide variety of agricultural mechanization courses are available to non-majors in support of programs in other departments. Many courses can be used as electives by students who wish to explore the field or use the information for other personal reasons.

The curriculum leading to the Bachelor of Science degree in Agricultural Mechanization is recognized by the American Society of Agricultural Engineers. The department also offers a minor in Agricultural Mechanization.

Description of Courses

For explanation see Index under "Symbols"

Ag M

101 Oxy-Acetylene Welding 2 (0-6) Principles of operation, use, and care of welding and cutting equipment. Cooperative course taught at the University of Idaho (AgMech ID101).

107 Arc Welding 2 (1-2) Principles of operation, use, and care of equipment. Cooperative course taught at the University of Idaho (AgMech ID107).

110 Introduction to Agricultural Mechanization 1 (0-3) For freshmen. Basic skills for analyzing, solving, and presenting mechanization problems.

201 Metals Shop Practices 3 (1-0-6) Theory, applications, and practices of welding, machining, and associated skills in using metals.

203 Building Construction 3 (2-3) Principles and practices in farm building construction; foundations, frames, materials, tools, and plans; experience with tools and materials.

211 Agricultural Machinery 3 (2-3) Principles, materials of construction, care, capacity of tillage, planting, spraying, harvesting, and materials handling machinery.

306 Agricultural Structures and Environmental Systems 3 (2-3) Planning farm buildings, construction materials, beam and column design, insulation and ventilation for environmental control. Cooperative course taught at the University of Idaho (AgMech ID306).

312 Engines and Tractors 3 (2-3) Principles of engine operation, fuels, combustion, efficiency, power transmission, energy conversion, power measurement, tractor safety and costs.

313 Small Engine Repair 1 (0-3) Prereq Ag M 312 or C/+. Repair, adjustment, protective maintenance, operation, and safety of small gasoline engine.

331 Agricultural Electrification 3 (2-3) Basic electricity, wiring, and electrical applications in agricultural production.

344 Irrigation and Drainage 3 Prereq Math 101; Soils 201. Principles of irrigation and drainage, water measurement, irrigation methods and practices, selection of irrigation system components.

345 Irrigation Laboratory 1 (0-3) Prereq Ag M 344 or C/+. Principles of soil moisture measurement techniques, water measurement, pumps and pump efficiencies, conveyance and distribution systems.

346 Turf Irrigation Systems 1 (0-3) Design, construction and operation of irrigation systems for turf and landscape plantings.

402 Methods, Materials, and Machines for Teaching Ag Mechanics 3 (1-0) Prereq Ag M 201, 203; 9 hrs Educ. Development of shop programs in project planning, demonstrations, and skills performance; safety and management of materials, tools, and machines.

403 Laboratory Projects Teaching Techniques 1 (1-3) May be repeated for credit; cumulative maximum 2 hours. Teaching techniques for laboratory projects in agricultural mechanics.

416 Mobile Hydraulics 3 (2-3) Prereq Ag M 312. Fluid power principles applied to the operation, selection, and maintenance of agricultural machinery.

421 Agricultural Building Design 3 Prereq Ag M 203. Loading, analysis, and design of structural components of agricultural buildings; foundations, frames, and connections.

426 Energy Concepts in Agricultural Structures 3 Prereq Ag M 203. Heat transfer, psychrometrics applied to temperature-moisture relationships in agricultural structures; renewable alternative energy sources. Credit not granted for both Ag M 426 and 526.

433 Agricultural Processing 3 Same as FSHN 433. Joint listing with the University of Idaho (AgMech ID405).

451 Seminar 1 Same as Ag E 451.

481 Advanced Agricultural Mechanization Topics 1-4 May be repeated for credit; cumulative maximum 8 hours. By interview only.

490 Instructional Practicum V 1-4 May be repeated for credit; cumulative maximum 4 hours.

492 Internship in Agricultural Mechanization V 1-3 May be repeated for credit; cumulative maximum 6 hours. Not open to freshmen. Prior approval of supervisor and advisor required. Work experience related to academic learning.

499 Special Problems V 1-4 May be repeated for credit.

526 Energy Concepts in Agricultural Structures 3 Graduate level counterpart of Ag M 426; additional requirements. Credit not granted for both Ag M 426 and 526.

Schedule of Studies

The Bachelor of Science degree in Agricultural Mechanization requires a total of 120 credit hours for graduation. Of these, at least 40 hours including 12 hours of Ag electives must be courses numbered 300 or above.

Freshman Year

First Semester
Ag M 201 Ag Storigate 3
Ag M 110 Intro Ag M 1
Chem 101 Intro Chem 4
Engl 101 English Composition 3
Math 107 Precalculus Algebra 3

Second Semester
Ag M 203 Ag Bldg Const 4
Chem 102 Chemistry Related to Man 4
Math 108 Precalculus Trig 2
Aris and Hum Elective 3
Social Science Elective 3

Sophomore Year

First Semester
Cpi S 105 Comp SW Bus 4
Phys 101 General Physics 4
Bio S 103 Intro Biol 4
Ag Elective 3

Second Semester
Ag M 211 Farm Machinery 3
Acct 230 Principles of Acct 4
Bio S 104 or Bot 120 4
Com Prof Elective 3
Ag Elective 3
Ag Ec 201 Econ Mgmt Ag 3
Agriculture and Liberal Arts


The undergraduate program in Agriculture and Liberal Arts offers an interdisciplinary curriculum that includes courses in agriculture, the social sciences and humanities. The objective of the program is to provide students with a broad liberal education and a special sensitivity to issues pertaining to agriculture, society and the environment. Elements of the program work to instill general analytical skills, a working acquaintance with several related scholarly disciplines, an overview of the influence of agriculture on the development of civilization, and an understanding of the agricultural sciences.

The program provides excellent preparation for the fields of agriculture, business, law, mass communications, and for government and international service.

Minor in Agriculture and Liberal Arts

The minor requires a total of 18 hours including Env S 101, Agron/Solls/AglA 360, Ag Ce/ Hist/AglA 320, AgHE/Phil/AglA 404; plus 6 hours approved electives from the courses listed below.

AglA 260 History of Landscape Architecture 3 Same as L A 260.

305 Leadership Development in Agriculture and Home Economics 3 Same as AgHE 305.
314 Culture of Peasants and Poverty 3 Same as Anth 314.
320 [S] American Agriculture and Rural Life 3 Same as AgCE 320.
325 Rural Values in Film/Drama 3 Same as Drama 325.
337 Agriculture and Civilization 3 Same as Anth 337.
371 Environmental Ethics 1 or 3 Same as Phil 370.
400 Comparative American Agriculture and Culture 3 Same as CAC 400.
404 Current Issues in Agriculture and Home Economics 3 Same as AgHE 404.
405 Public Policy in Agriculture and Home Economics 3 Same as AgHE 405.
444 Rural Development in International Agriculture and Home Economics 3 Same as AgHE 444.

In addition to the courses listed above, supporting course work is offered in agriculture and liberal arts:

Agriculture

Agron 101 Field Crop Sci 3
A S 101 Intro A S 3
Ag Ce 201 [S] Econ in Agric 3
Hort 201 Intro Hort Sci 3
Soils 201 Soils 3
Ag Ce 420 Intnl Agric 3
Ag Ce/Poli Pol/Ed Ad 422 Public Admin 3
Ag Ce 425 Econ Analysis 3
Ag Ce 490 Agric Policy 3

Liberal Arts

Soc 201 Intro Soc 3
Pol S 416 Policy Analysis 3
Soc/Pol S/Anth Intnl Dev 3

Students are encouraged to participate as part-time employees in agronomic or soils research programs and as professional interns with agricultural industries. 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 the Agronomy and Soils Club.

Agronomists examine metabolic and developmental processes of crop plants, develop improved crop varieties through plant breeding and genetic engineering technology, study alternative crop production and management practices which conserve natural resources while enhancing crop yields, and investigate the impact of agricultural production on agricultural and nonagricultural ecosystems. turf management opportunities include golf courses and playfields. Graduates qualify for careers in agribusiness, corporate and technical farm management, and research, sales, and service positions. Positions are available in government and commercial agencies such as Agricultural Research and Extension, Departments of Agriculture, Agricultural Research Service, Natural Resources, and the Soil Conservation Service as well as in food processing companies, insurance agencies, and commercial concerns dealing with farm products, fertilizers, and agricultural chemicals and seeds. Opportunities also exist for employment and further study in international agricultural development. Teaching, research, and extension careers are available in community colleges and universities for graduates with advanced degrees.

The department offers courses of study leading to the degrees of Bachelor of Science in Agronomy, Bachelor of Science in Agronomy, Bachelor of Science in Agriculture, Bachelor of Science in Agronomy and Doctor of Philosophy.

Description of Courses

For explanation see Index under "Symbols"

Agron

101 Introductory Field Crop Science 3 Production and adaptation of cultivated crops; principles affecting growth, development, management, and utilization.

201 Growth and Development of World Crop Plants 4 (2-2) Prereq Agron 101 or c/. Ontogeny of temperate and tropical crop plants; basics of evolution, distribution, anatomy, morphology, and physiology.

301 Turfgrass Culture 3 (2-3) Principles of establishment and management of turf for lawns, parks, and golf courses. Field trip required.


301 Grain Crops 3 Prereq Bot 120 or Bio S 104; Agron 201. Adaptation, production, and utilization of cereals, grain legumes, and oilseed crops. Field trip required.


450 Seed Conditioning 1 (0-3) Prereq Agron 201 or 410. Principles and processes of separating seeds of different physical characteristics. Field trip required.

410 Seed Production and Technology 3 (2-3) Prereq Bio S 104 or Bot 120; Bot 320. Principles of seed production, physiology and quality evaluation. Field trip required.
411 Environmental Crop Physiology 3 Prereq Bot 320. 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.

413 Biology of Weeds 3 Prereq Bot 320, Biology, ecology, and physiology of weeds; crop and weed interactions and interference. Credit not granted for both Agron 413 and 513. (a/v) Cooperative course taught at the University of Idaho (PSCI ID410/S10).

445 Plant Breeding 3 Prereq GenCB 301. Genetic principles applied to the improvement of plants.

469 Vegetable Seed Production 2 Survey of vegetable seed industry, production methods and quality evaluation. (a/v) Joint listing with the University of Idaho (PSCI ID469).

496 Advanced Topics in Agronomy V 1-3 Prereq Bot 320 or Bio S 372. (SS)

498 Professional Internship V 1-3 May be repeated for credit; cumulative maximum 9 hours. Planned and supervised professional work experience.

499 Special Problems V 1-4 May be repeated for credit.

504 Advanced Plant Breeding 4 Prereq Agron 445, Genetic, cytogenetic, and statistical theories and principles underlying modern methods. (a/v)

505 Improvement of Crop Quality 3 Prereq Agron 445, BC/BP 364 or Bot 320. Principles and methods of crop quality improvement by crop management, plant breeding and integrated approaches. (a/v)

507 Herbicide Development and Application 3 (2-3) Prereq Agron 305; Bot 320; Soils 201. Herbicide discovery, formulation, toxicity, and fate in the environment; application equipment; professions in weed science. (a/v)

508 Seed Physiology 3 Prereq BC/BP 364. Physiology and biochemistry of seed development, germination, and dormancy. (a/v)

509 Physiology in Plant Breeding 3 Prereq GenCB 301; Bot 320. Theory and methodology associated with the use of physiological and biochemical techniques in plant breeding programs. (a/v)

510 Seminar 1 May be repeated for credit. Literature review; preparation and presentation of reports in crop science.

512 Topics in Agronomy V 1-2 May be repeated for credit. Concepts of plant breeding, seed physiology, and technology; crop physiology and management.

513 Biology of Weeds 3 Graduate level counterpart of 413; additional requirements. Credit not granted for both Agron 413 and 513.

538 Properties and Functions of Herbicides 2 Prereq Bot 320. Physical and chemical properties and mode of action of herbicides, their effects on plant structure, internal mechanisms, processes and sites of action. (a/v) Cooperative course taught at the University of Idaho (PSCI ID538).

560 Applied Seed Physiology 2 (1-3) Prereq Bot 320, Impact of physiological and environmental factors on seed germination, vigor and establishment of commercially important crop species. (a/v) Cooperative course taught at the University of Idaho (PSCI ID60).

600 Special Projects or Independent Study Variable credit.

700 Master’s Research, Thesis, and/or Examination Variable credit.

702 Master’s Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

General Departmental Requirements

At least 40 hours of the total required for Agronomy must be in upper-division courses. Core and option requirements cannot be taken pass/fail.

**CORE REQUIREMENTS**

The core courses are common to all Agronomy majors and include General University Requirements and supporting courses. The two departmental undergraduate curricula offer flexibility in courses and selection of electives that best suit the individual student’s needs and interests. The student must consult an adviser.

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agron 101, 201, 305, 411, 412, 445, 498, and 499</td>
<td>18</td>
</tr>
<tr>
<td>Bot 320</td>
<td>3</td>
</tr>
<tr>
<td>GenCB 301</td>
<td>4</td>
</tr>
<tr>
<td>Soils 201</td>
<td>4</td>
</tr>
<tr>
<td>PI P 429</td>
<td>3</td>
</tr>
<tr>
<td>Entom 340 or 343</td>
<td>3</td>
</tr>
<tr>
<td>Chem 105, 106, 107 (or 101, 102), and 240</td>
<td>12</td>
</tr>
<tr>
<td>Math Elective (101, 107, 140, 171)</td>
<td>3</td>
</tr>
<tr>
<td>Stat Elective (310, 412)</td>
<td>3</td>
</tr>
<tr>
<td>Comp Elective (Engl 101 and AgHE 203 or Spe)</td>
<td>6</td>
</tr>
<tr>
<td>Bio 105, 106, or Bot 120</td>
<td>12</td>
</tr>
<tr>
<td>Hum Electives</td>
<td>6</td>
</tr>
<tr>
<td>Soc S Electives (inc Econ or Ag Ec 201)</td>
<td>6</td>
</tr>
<tr>
<td>Computer Science Elective 1-4</td>
<td></td>
</tr>
<tr>
<td>Interdisciplinary Studies</td>
<td>3</td>
</tr>
</tbody>
</table>

In addition to core courses students must select either the technical or science curriculum.

**Agronomy elective courses include:** Agron 301, 302, 303, 405, 416, 469, 498, and 499. A maximum of 3 credits of 498 can be used to satisfy Agronomy electives. UH 450 may substitute for Agron 499.

**TECHNICAL**

Emphasis is on basic principles and application techniques for production and management. The courses are concerned with the production of field crops, processing and marketing agricultural products. Various options offer specialization in interest areas. Students in this curriculum must complete one of the listed options.

**Production and Management Option.** For students who wish to engage in farming or corporate farm management and field agronomy positions.

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agron 410</td>
<td>3</td>
</tr>
<tr>
<td>Agron 302 or 303 and Agron Electives</td>
<td></td>
</tr>
<tr>
<td>Ag Ec 340</td>
<td>3</td>
</tr>
<tr>
<td>Soils 301, 422, 441</td>
<td>6</td>
</tr>
<tr>
<td>Ag M 344</td>
<td>3</td>
</tr>
</tbody>
</table>

**Turf Management Option.** For students who wish to specialize in golf course supervision and similar recreation positions involving agronomic management techniques and personal relations.

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agron Electives</td>
<td></td>
</tr>
<tr>
<td>Micro 101 or 106</td>
<td>4-5</td>
</tr>
<tr>
<td>Bio S 372, Soils 431, or Hort 417</td>
<td></td>
</tr>
<tr>
<td>PI P 405, Entom 450, IPM 452</td>
<td></td>
</tr>
<tr>
<td>Soils 301, 422, 441</td>
<td>2-3</td>
</tr>
<tr>
<td>Ag M 344</td>
<td>6</td>
</tr>
</tbody>
</table>

**Soils Option.** For students seeking training in soil and land management and plant/soil relationships.

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agron Electives</td>
<td>6</td>
</tr>
<tr>
<td>Geol 101 or 102</td>
<td>6</td>
</tr>
<tr>
<td>Soils Electives</td>
<td>5-6</td>
</tr>
<tr>
<td>Soils 301, 422 and 421 or 441</td>
<td>7</td>
</tr>
<tr>
<td>Ag M 344</td>
<td>3</td>
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<tr>
<td>Env S 174</td>
<td>3</td>
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</tbody>
</table>

**SCIENCE**

This curriculum prepares students for advanced studies as scientists in the areas of crop physiology, plant breeding, and environmental quality. Students may prepare for research careers in industry, as technicians and experimental aides, or for teaching and research positions in colleges, universities, and governmental agencies. Emphasis is given to basic principles and techniques related to plant morphology and metabolism. Students in the curriculum must complete:

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agron Electives</td>
<td></td>
</tr>
<tr>
<td>Chem 220 and 222 or 117</td>
<td>6</td>
</tr>
<tr>
<td>BC/BP 364, 366 or 463, 464</td>
<td>4-8</td>
</tr>
<tr>
<td>Math 171 or 140</td>
<td>3</td>
</tr>
<tr>
<td>Phys 101, 102</td>
<td>12</td>
</tr>
<tr>
<td>Micro 101 or 201</td>
<td>8</td>
</tr>
<tr>
<td>Soils 414 or Bot 332</td>
<td>4-5</td>
</tr>
<tr>
<td>FSHN 482 or Micro 416</td>
<td>2-4</td>
</tr>
</tbody>
</table>

**Minor**

A minor in agronomy may be obtained by students from other departments. See Agronomy adviser.

**Transfer Students**

Students planning to transfer to Washington State University should take courses which meet agronomy core requirements.

**Program in American Studies**

Associate Professor and Director, S. Armitage; Professors, L. Ashby, E. M. Bennett, O. G. Clanton, R. L. Hume, D. H. Stratton (History), J. R. Elwood, O. J. Johnson, R. C. Mclean (English), T. Heuterman, D. B. Strother, A. Tun (Communications), M. E. Wingate (Speech); Associate Professors, J. Jameson (History), J. Burbick, A. L. Hammond, R. G. Law, A. Von Frank (English), B. Winfield (Communications), L. Harris (Speech), A. Kuo (Comparative American Cultures); Assistant Professors, D. Coon (History), S. Platt (Fine Arts), J. Peterson, E. Smith, S. Sumida (Comparative American Cultures).

The Program in American Studies offers courses of study leading to the degrees of Bachelor of Arts in American Studies, Master of Arts in American Studies, and Doctor of Philosophy (American Studies).
The undergraduate program in American Studies offers an interdisciplinary sequence of courses that enables an interdisciplinary sequence of courses that enables the student to study and interpret American culture. The aim is integrative, investigating American society, political institutions, literature, and art. The contribution of minority groups to America and the expressions of mass and popular culture are also included. Basically, the program promotes an understanding of why, in the words of Henry James, it is a complex fate to be an American.

The bachelor's degree program, in addition to preparing students for graduate work in the fields of American literature and history, as well as American Studies, offers excellent preparation for law school, and for the fields of mass communication and government service.

### Degree Requirements

The program consists of a core curriculum of 30 hours (with some options available within the core) plus an additional 9 hour area of concentration which permits students to investigate particular aspects of American culture. Courses in the core areas of concentration may also be used to satisfy General University Requirements, where applicable.

### Core Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Hist 110, 111 American History</td>
<td>6</td>
</tr>
<tr>
<td>Engl 245, 246 American Literature</td>
<td>6</td>
</tr>
<tr>
<td>Engl/Hist 216 American Culture</td>
<td>3</td>
</tr>
<tr>
<td>Engl 470 American Culture Series</td>
<td>3</td>
</tr>
<tr>
<td>American literature (upper-division)</td>
<td>3</td>
</tr>
<tr>
<td>American history (upper-division)</td>
<td>3</td>
</tr>
<tr>
<td>Two courses (6 hours) taken in two different departments, from:</td>
<td></td>
</tr>
<tr>
<td>Phil 436 American Philosophy</td>
<td></td>
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<tr>
<td>Pol S 300, 318, 427, 434, 455</td>
<td></td>
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<tr>
<td>Soc 311, 342, 351</td>
<td></td>
</tr>
<tr>
<td>SpCom 425 History and</td>
<td></td>
</tr>
<tr>
<td>Criticism of Public Address</td>
<td></td>
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<tr>
<td>F A 304 American Art</td>
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</tr>
</tbody>
</table>

### Areas of Concentration

Prescribed courses have been established in the following departments to satisfy the 9-hour requirement for an area of concentration:

1. Comparative American Cultures:
   - Asian American Studies
   - Black Studies
   - Chicano Studies
   - Native American Studies
2. History
3. Literature
4. Political Science
5. Sociology

Also, it is the intention of the American Studies faculty that certain students, with the approval of their advisers, be permitted to investigate areas not officially approved in the foregoing list, by designating their own programs and taking courses that will aid in their research. Thus, certain students may wish to investigate the effects of agriculture, engineering, environmental science, science, the graphic arts, theatre, or mass communications, to name only several possibilities, on American culture.

### Minor in American Studies

A minor in American Studies requires 18 hours which shall include:

### Preparation for Graduate Study

Students interested in the Master of Arts degree program in American Studies should offer preparation approximating the undergraduate program described above, or a bachelor's degree in English or History. Students with degrees in other humanities or social sciences areas may be accepted. Students interested in the PhD degree program must have the MA in English, History, or American Studies. Every student should be well grounded in at least one modern European foreign language.

### Department of Animal Sciences


The department 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. The department also participates in the graduate programs in Nutrition and Genetics and Cell Biology which offer Master of Science and Doctor of Philosophy degrees.

### Bachelor's Program

The curriculum is designed to prepare students for positions in animal husbandry, agriculture, for positions with industrial and commercial firms and government agencies related to animal agriculture, and to prepare students for advanced study programs involving research, teaching, extension, or veterinary medicine.

Core courses are required for all majors in the department. Prior to their junior year students select one of eleven options to further their interests. These options specify courses in addition to the core courses.

Six production options including general livestock, range livestock, beef cattle and sheep, dairy cattle, swine, and poultry permit specialization in animal commodity areas. These options emphasize commercial animal agriculture operations for students intending to work in farm production or in related industries. Employment opportunities relate to herds and flocks, feed lots, general management including self-employment, and to sales promotion for livestock and poultry operations. Further opportunities are with financial organizations, animal product processors and sales, feed suppliers, artificial insemination organizations and miscellaneous field representatives serving animal agriculture.

Meats is an option available to students interested in carcass animal evaluation and product processing. Graduates also enter federal employment.

Animal biology, animal breeding, animal nutrition, and animal physiology are individual options dealing with disciplines applicable across animal commodity groups. Employment opportunities are found with laboratories, pharmaceutical companies, reproduction service agencies and with feed companies. In addition, the animal biology option specifically prepares students for entrance into the College of Veterinary Medicine.

Each of these four options is also used in preparation for graduate studies for further specialization in the disciplines.

### Description of Courses

For explanation see Index under "Symbols"

<table>
<thead>
<tr>
<th>A</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>Introductory Animal Science 3 (2-3) Types and breeds of livestock, terminology, methods, management systems, techniques of animal and poultry production and consumer impact.</td>
</tr>
<tr>
<td>164</td>
<td>Poultry Management Laboratory 1 (0-3) Management practices associated with hatchery, broiler, and laying hen enterprises. Special clothing required.</td>
</tr>
<tr>
<td>172</td>
<td>Dairy Cattle Management Laboratory 1 (0-3) Management practices associated with a dairy enterprise.</td>
</tr>
<tr>
<td>174</td>
<td>Beef Calf-Management Laboratory 1 (0-3) Management practices associated with a beef calf enterprise for students without experience.</td>
</tr>
<tr>
<td>176</td>
<td>Sheep Management Laboratory 1 (0-3) Management practices associated with a farm flock sheep enterprise.</td>
</tr>
<tr>
<td>178</td>
<td>Swine Management Laboratory 1 (0-3) Management practices associated with a swine enterprise. Field trip and special clothing required.</td>
</tr>
<tr>
<td>213</td>
<td>Applied Animal Nutrition 3 Prereq one sem Chem; one sem Bio S. Not open to S majors. Characteristics of nutrients, nutritional requirements, ration calculations and feeding practices for farm animals. Credit not granted for both A 213 and 313.</td>
</tr>
<tr>
<td>260</td>
<td>Live Animal and Carcass Evaluation 3 (1-6) Basic principles of live animal and carcass evaluation.</td>
</tr>
<tr>
<td>266</td>
<td>Horses and Horsemanship 3 (2-3) Not open to 1st-semester freshmen. History and evolution; anatomy and physiology; principles of selection; care and basic training of horses.</td>
</tr>
<tr>
<td>272</td>
<td>Dairy Cattle Traits 2 (1-3) Evaluating form and function in dairy cattle; measurement of production and evaluation of type.</td>
</tr>
<tr>
<td>313</td>
<td>Feeds and Feeding 4 (2-3) Prereq Bio S 102 or 104. Utilization, practices, requirements, nutritive characteristics, and calculations of rations for animals. Field trip required. Credit not granted for both A 213 and 313.</td>
</tr>
<tr>
<td>314</td>
<td>Principles of Nutrition 3 Prereq Bio S 104; Chem 102 or 106; Chem 111 or 246. Digestion, absorption, metabolism, and function of nutrients.</td>
</tr>
<tr>
<td>330</td>
<td>Genetics of Farm Animals 3 (2-3) Prereq GenCB 301; Stat 310 or 412. Genetic principles applied to breeding of farm animals.</td>
</tr>
<tr>
<td>Course Code</td>
<td>Hours</td>
</tr>
<tr>
<td>-------------</td>
<td>-------</td>
</tr>
<tr>
<td>Arts and Hum Elective</td>
<td>6</td>
</tr>
<tr>
<td>Ag Ec 201 or Econ 203</td>
<td>3</td>
</tr>
<tr>
<td>Soc S Elective</td>
<td>3</td>
</tr>
<tr>
<td>AgEng 101 and 201 or 402</td>
<td>6</td>
</tr>
<tr>
<td>AgHE 201 or SpCom 102</td>
<td>3</td>
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<tr>
<td>Math 107 or 201</td>
<td>3</td>
</tr>
<tr>
<td>Bio 103 and 104</td>
<td>8</td>
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<tr>
<td>Chem 101 and 102, 105, 106, and 107</td>
<td>8-9</td>
</tr>
<tr>
<td>Chem 240</td>
<td>4</td>
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<tr>
<td>Stat 310 or 412</td>
<td>3</td>
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<tr>
<td>GenCB 301</td>
<td>4</td>
</tr>
<tr>
<td>V An 308</td>
<td>3</td>
</tr>
<tr>
<td>A S 101, 313, 314, 330, 350, 351, 380, 440 and 441</td>
<td>21</td>
</tr>
<tr>
<td>One of the following options must be chosen. The courses listed for that option are required in addition to the above core.</td>
<td></td>
</tr>
<tr>
<td>General livestock: A S 260, 360; three of A S 464, 466, 472, 474, 476, 478; Ag Ec 340; Ag Ec 335 or B Law 210; Ag Ec 430 or Acc 230; Agron 302.</td>
<td></td>
</tr>
<tr>
<td>Range livestock: Soc 270 or 340; Agron 302 or 305; Soils 201 or 404; Ag Ec 340; V M S 261; FRM 351, 352, 354, 452, 456; A S 174, 176, 260, 474, 476; FRM 390 and A S 399 Internship.</td>
<td></td>
</tr>
<tr>
<td>Beef cattle and sheep: A S 260, 360, 410; A S 174, 176, 474, 476, 478; Ag Ec 340; A S 335 or B Law 210; Ag Ec 430 or Acc 230; Agron 302 or FRM 352; V M S 261.</td>
<td></td>
</tr>
<tr>
<td>Dairy cattle: A S 172, 272, 410, 452, 472; Ag Ec 340; Ag Ec 335 or B Law 210; Ag Ec 430 or Acc 230; Agron 302; FSHN 305; V M S 261.</td>
<td></td>
</tr>
<tr>
<td>Swine: A S 178, 260, 360, 404, 478; Ag Ec 340; Ag Ec 335 or B Law 210; Ag Ec 430 or Acc 230; Ag M 203; V M S 261.</td>
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<tr>
<td>Poultry: A S 464, 466; one of A S 260, 360, FSHN 102 or 305; Ag Ec 340; Ag Ec 335 or B Law 210; Ag Ec 430 or Acc 230; V M S 261.</td>
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</tr>
</tbody>
</table>

### Schedule of Studies

At least 40 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

### Core Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts and Hum Elective</td>
<td>6</td>
</tr>
<tr>
<td>Ag Ec 201 or Econ 203</td>
<td>3</td>
</tr>
<tr>
<td>Soc S Elective</td>
<td>3</td>
</tr>
<tr>
<td>AgEng 101 and 201 or 402</td>
<td>6</td>
</tr>
<tr>
<td>AgHE 201 or SpCom 102</td>
<td>3</td>
</tr>
<tr>
<td>Math 107 or 201</td>
<td>3</td>
</tr>
<tr>
<td>Bio 103 and 104</td>
<td>8</td>
</tr>
<tr>
<td>Chem 101 and 102, 105, 106, and 107</td>
<td>8-9</td>
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<tr>
<td>Chem 240</td>
<td>4</td>
</tr>
<tr>
<td>Stat 310 or 412</td>
<td>3</td>
</tr>
<tr>
<td>GenCB 301</td>
<td>4</td>
</tr>
<tr>
<td>V An 308</td>
<td>3</td>
</tr>
<tr>
<td>A S 101, 313, 314, 330, 350, 351, 380, 440 and 441</td>
<td>21</td>
</tr>
</tbody>
</table>

One of the following options must be chosen. The courses listed for that option are required in addition to the above core.

### General livestock:
- A S 260, 360; three of A S 464, 466, 472, 474, 476, 478; Ag Ec 340; Ag Ec 335 or B Law 210; Ag Ec 430 or Acc 230; Agron 302.
- Range livestock: Soc 270 or 340; Agron 302 or 305; Soils 201 or 404; Ag Ec 340; V M S 261; FRM 351, 352, 354, 452, 456; A S 174, 176, 260, 474, 476; FRM 390 and A S 399 Internship.
- Beef cattle and sheep: A S 260, 360, 410; A S 174, 176, 474, 476, 478; Ag Ec 340; A S 335 or B Law 210; Ag Ec 430 or Acc 230; Agron 302 or FRM 352; V M S 261.
- Dairy cattle: A S 172, 272, 410, 452, 472; Ag Ec 340; Ag Ec 335 or B Law 210; Ag Ec 430 or Acc 230; Agron 302; FSHN 305; V M S 261.
- Swine: A S 178, 260, 360, 404, 478; Ag Ec 340; Ag Ec 335 or B Law 210; Ag Ec 430 or Acc 230; Ag M 203; V M S 261.
- Poultry: A S 464, 466; one of A S 260, 360, FSHN 102 or 305; Ag Ec 340; Ag Ec 335 or B Law 210; Ag Ec 430 or Acc 230; V M S 261.

### Schedule of Studies

At least 40 of the total hours required for the bachelor's degree in this program must be in upper-division courses.
**Description of Courses**

For explanation see Index under "Symbols"

**Anth**

101 [S] General Anthropology 3 Major subfields of anthropology; physical (human evolution and race), cultural-social, archaeology, and linguistics.

130 Great Discoveries in Archaeology 3 Impact of great archaeological discoveries and the work of archaeologists on our sense of the past.

198 [S] Anthropology Honors 3

201 [H] Art and Society 3 Art as an expression of social and cultural systems in preliterate societies.

203 [S] Peoples of the World 3 Principles of cultural anthropology through study of various ethnic groups from different parts of the world.

230 Introduction to Archaeology 3 2-3 Development of a dynamic picture of past human behavior from archaeological evidence.

250 Introduction to Phonetics and Phonology 3 Introduction to phonetics and phonology; speech sounds and their organization in natural language.

256 The Organization of English 3 Same as Engli 256.

260 [B] Introduction to Physical Anthropology 3 Evidence for human evolution; processes of racial diversification; techniques of physical anthropology.

300 Field Methods 2-8 Prereq permission by application. Practice in methods of archaeological, ethnological, or linguistic field research. (Sem.)

301 Culture and Personality 3 Prereq Anth 101 or Soc 101. The individual as the product and carrier of culture; personality development in selected world societies; anthropological concept of personality types.

303 [S] Religion in Culture 2 Prereq Anth 101 or 203. Paleolithic and modern religious concepts, practices, and practitioners; origins and function of religion.

304 [S] Anthropology and World Problems 3 Prereq Anth 101 or 203. Data and techniques of physical and cultural anthropology applied to the solution of social and political problems.

306 Cultures and Peoples of the Middle East 3 Contemporary Arab cultures in a historical perspective within the framework of Western-Middle Eastern relations.

309 [K] Cultural Ecology 3 Prereq 3 hrs Anth. Major findings of ecological anthropology relating to problems of population, resources, and environment in primitive cultures.

314 Culture of Peasants and Poverty 3 Peasant and folk cultures seen in the perspective of international development, mass poverty, and revolutionary movements.

316 Gender and Culture 3 Cross-cultural examination of the status and roles of women and men, the institution of marriage, and symbols of gender valuations.

**Department of Anthropology**

Professor and Department Head, R. A. Littlewood; Professors, R. E. Ackerman, J. H. Bodley, F. A. Hassan, W. D. Lipe, P. I. Mehringer, A. W. Willard; Professors Emeritus, T. A. Gorski; Associate Professors, M. S. Fleisher, G. L. Gamble, C. E. Gustafson, T. A. Kohler, G. S. Krantz, D. A. Messerschmidt, Assistant Professor, L. S. Stone.

The courses in anthropology are designed to familiarize the student with human evolution, the prehistoric development of culture, linguistics, and the role of cultural systems in contemporary Western and non-Western societies. The major in anthropology requires training in anthropological theory, archaeology, human development, human society and culture, linguistics and linguistic anthropology. Positions open to anthropologists include those in teaching, research, museum work, state and federal agencies, and private consulting firms. In addition, anthropology provides a strong option for a liberal arts education.

Courses within archaeology are designed to broaden opportunities for students interested in interdisciplinary problems relating to human prehistory by integrating traditional course work with courses in Quaternary geochronology, chronology, and paleoecology. Courses are taught by staff members with specialties in geology, paleontology, and vertebrate paleontology. Additional work in related fields is encouraged at WSU and through exchange courses with the University of Idaho. The interdisciplinary emphasis is enhanced by the diverse environmental settings of the state and emphasis on field work.

The extensive anthropological collections in the library include the Human Relations Area Files and the Peabody Museum Catalog on anthropological publications. In addition archaeological and ethnographic collections maintained by the department are also available for study. The anthropology museum has both permanent and traveling exhibits dealing with a variety of subjects including in North American prehistory. This museum is open to the public and special tours can be arranged.

The department offers a course of study leading to the degrees of Bachelor of Arts in Anthropology, Master of Arts in Anthropology, and Doctor of Philosophy (Anthropology).

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1 Open only to students in the Honors Program.
theory in American archaeology. Credit not granted for both Anth 430 and 530.

435 Cultural Resource Management 3 Role of archaeology in historic preservation and resource conservation; legal and institutional frameworks; research in a management context.

436 Ethnoarchaeology 3 Multidisciplinary approach, (archaeology, ethnography and history) to the interpretation of man's past cultures. Credit not granted for both Anth 436 and 536.


450 Descriptive Linguistics 3 Introduction to analysis and description of natural languages; phonological, syntactic, and semantic analysis of data from a variety of languages. Credit not granted for both Anth 450 and 550.

456 Historical Linguistics 3 Prereq Anth 450. Historical study of language, sound change, grammatical change, semantic change. Credit not granted for both Anth 456 and 556.

462 Human Issues in International Development 3 Prereq senior or graduate student. Interdisciplinary analysis of complex interaction between tradition and modernity in Third World society, and its attendant human predicament. Credit not granted for both Anth 462 and 562.


466 Human Osteology 3 (2-3) Prereq Anth 260. Observations and measurements of human skeleton; variations based on age, sex, and race; comparison with fossil man and higher primates. Credit not granted for both Anth 466 and 566.

499 Special Problems V 1-4 May be repeated for credit.

500 Field School V 2-4 Training in gathering and analyzing field data. (SS)

501 History of Anthropological Theory 3 Graduate level counterpart of Anth 401; additional requirements. Credit not granted for both Anth 401 and 501.

502 Cross-Cultural Gender and Kinship 3 Graduate level counterpart of Anth 402; additional requirements. Credit not granted for both Anth 402 and 502.

504 Tribal Peoples and Development 3 Global and historic perspectives on the complex issues surrounding the problem of tribal peoples and development.

506 Research Design and Methods 3 Design of research projects, retrieval and analysis of anthropological data, funding sources, and preparation of research proposals; technical presentations of data.

507 Advanced Social Stratification 3 Culture Theory 3 May be repeated for credit; cumulative maximum 6 hours. Prereq 6 hrs Soc S. Evaluation of major theories and methods and their relationship to problems in cultural-social analysis.

509 Ecological and Economic Anthropology 3 Ecological principles applied to problems involving human populations.

510 Advances in Anthropology 3 Major developments and issues in cultural and social anthropology.

512 Primate Stoneworking 3 Aboriginal stoneworking methods and their application to archaeology.

518 (562) Human Issues in International Development 3 Graduate level counterpart of Anth 418; additional requirements. Credit not granted for both Anth 418 and 518.

528 Topics in Ethnography 3 Graduate level counterpart of Anth 428; additional requirements. Credit not granted for both Anth 428 and 528.

530 Introduction to Archaeological Method and Theory 3 Graduate level counterpart of Anth 430; additional requirements. Credit not granted for both Anth 430 and 530.

536 Ethnoarchaeology 3 Graduate level counterpart of Anth 436; additional requirements. Credit not granted for both Anth 436 and 536.

537 Quantitative Methods in Anthropology 3 (3-3) May be repeated for credit; cumulative maximum 8 hours. Prereq undergraduate stat course. Sampling, data analysis, inferential statistics, microcomputer and mainframe use applied to anthropological problems with emphasis on archaeology.

539 Prehistory of the Upland Southwest 3 Prereq of upland portions of American Southwest; emphasis on Anasazi and Mogollon traditions and relationships to present-day Pueblos.

540 Prehistory of the Northwest Coast 3 Prehistoric cultures, chronologies, and interrelationships on the Northwest Coast of North America.

542 Prehistory of Alaska and Eastern Siberia 3 Prehistoric cultural developments in the Arctic and sub-Arctic zones of Asia and North America.

543 Plateau Prehistory 3 Anthropology of the interior Northwest.

545 Historical Anthropology 3 Excavation and analysis of historical archaeological sites; cultural-ecological implications. Cooperative course taught at the University of Idaho (Anth ID331).

547 Material Anthropology 3 Models and model-building as an anthropological approach to present and past cultures.

550 Descriptive Linguistics 3 Graduate level counterpart of Anth 450; additional requirements. Credit not granted for both Anth 450 and 550.

554 Seminar in Anthropological Methods 3 Prereq Anth 450, 510. Elaboration, recording techniques and analysis of sociocultural, and linguistic field data; field work and seminar orientation.

556 Historical Linguistics 3 Graduate level counterpart of Anth 456; additional requirements. Credit not granted for both Anth 456 and 556.

559 Seminar in Linguistics 3 May be repeated for credit. History of theory of linguistics; sociolinguistics; linguistics and reconstruction of culture history; mathematics and computer linguistics.


562 Human Issues in International Development 3 Graduate level counterpart of Anth 462; additional requirements. Credit not granted for both Anth 462 and 562.

563 Human Races 3 Graduate level counterpart of Anth 463; additional requirements. Credit not granted for both Anth 463 and 563.

565 Human Evolution 3 Graduate level counterpart of Anth 465; additional requirements. Credit not granted for both Anth 465 and 565.

566 Human Osteology 3 (2-3) Graduate level counterpart of Anth 466; additional requirements. Credit not granted for both Anth 466 and 566.

570 Sediments in Geomorphology 3 (3-3) Sediment-forming processes, sedimentological techniques, reconstruction of quaternary environments, and sedimentology of siliciclastic processes.

571 Quaternary Environments and Paleoclimate 3 (3-3) Prereq Anth 570. Advances in palaeoclimatology, quaternary stratigraphy, reconstructing past environments and climates through botanical, faunal, and geostratigraphic methods. Field trip required.

572 Identification of Fossil Remains 3 (2-6) The relevance of fossil remains in archaeological context; excavating, preserving, and identifying bones commonly encountered in archaeological sites. Field trip required.

576 Paleontology 3 (3-3) Pollen and spore morphology, evolution, production, dispersal, and preservation; index fossils, dating, archeology, and vegetation history. Field trip required.

591 Special Topics in Anthropology 3 May be repeated for credit; cumulative maximum 9 hours. Examination of current areas of anthropological theory and research.

592 Special Topics in Anthropology 3 May be repeated for credit; cumulative maximum 9 hours. Examination of current areas of anthropological theory and research.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Schedule of Studies

At least 40 of the total hours required for the bachelor's degree in this program must be in upper-division courses. A student majoring in anthropology is required to take a minimum of 16 hours in anthropology, half of which are to be in upper-division courses. The anthropology major must achieve a grade of C- or better in Anth 203, 230, 260, and in one course from each of the following series:

- Anth 201, 301, 303, 309, 315, 351, 363, 365, 394, 398
- Anth 304, 306, 314, 320, 322, 323, 355, 359, 360
- Anth 401, 402, 418, 419, 424
- Anth 330, 331, 336, 337, 370
- Anth 463, 465, 466
- Anth 480, 481, 482, 483, 484
- Anth 101, 120, 250, 256, 300, 350, 355, 400, 430, 435, 436, 446

Majors in anthropology are advised to take advanced work in two supporting fields.

Preparation for Graduate Study

As preparation for work toward an advanced degree a student should have completed not less than 18 hours in anthropology.

School of Architecture


The School of Architecture offers courses of study leading to three baccalaureate degrees. These are Bachelor of Architecture, Bachelor of Science in
Construction Management, and Bachelor of Science in Architectural Studies.

Starting in the fall semester of 1987, the School of Architecture will offer a course of study leading to a Master of Science in Architecture which will emphasize energy and resource management as related to architecture.

Architects are trained to perform professionally in a wide range of design and construction related areas and assume important roles in the creation of a better built environment. They may work as independent practitioners, for large corporate firms or for governmental organization. Architects are required to possess a high level of intuitive, analytical, and technical skills combined with a deep understanding of human values and needs.

The construction manager is expected to be conversant in a wide variety of structures that make up man's physical environment. This includes properties of materials and construction systems and how they are fabricated to produce buildings. The student is expected to develop an inquisitive and inventive mind to deal with new construction methods and management techniques. It is also important that the person in construction management be knowledgeable of the field of business. Courses are offered in a variety of departments to assure this breadth of understanding.

The school is a member of the Association of Collegiate Schools of Architecture and the Associated Schools of Construction. Student chapters of the American Institute of Architects and the Associated General Contractors provide a professional link with their professional counterparts. The professional Bachelor of Architecture degree program is accredited by the National Architectural Accrediting Board.

Description of Courses

For explanation see Index under "Symbols"

Architecture

Arch 101 Graphics Communication I 3 (0-6) Drawing to perceive three-dimensional space; freehand (architectural) drawing, drafting, isometric and orthographic drawing, perspective, shades and shadows, lighting, and rendering techniques.

Arch 102 Graphics Communication II 3 (0-6) Prereq Arch 101. Continuation of Arch 101. Refinement of presentation techniques; exposure to other perspective drawing and presentation methods.

Arch 103 Graphics Communication III 6 (0-18) Introduction to graphics communication techniques; freehand drawing, drafting, orthographic projection, perspective, shades, shadows, and rendering. (SS)

Arch 120 [H] Architectural History I 3 Development from prehistory to the Gothic Cathedral; influences of society, climate, materials on buildings from simple shelters to monumental architecture.

Arch 121 [H] Architectural History II 3 Development of American architecture; cave dwellings, native American progress, colonial styles to contemporary architecture; effects of European styles upon America.

Arch 201 Introductory Design I 3 (0-6) Prereq Arch 101, 102. Two- and three-dimensional basic designs of visual and structural phenomena.

Arch 202 [H] The Built Environment 3 Planning and design of the built environment; products, interiors, structures, landscapes, cities; factors and process affecting environmental quality.

Arch 203 Introductory Design II 3 (0-6) Prereq Arch 201. Determinants of traditional, contemporary, and future space enclosure systems.

Arch 301 Architectural Design 4 (0-12) Prereq major in Arch; c/w in Arch 307. Small- to large-scale physical planning and architectural design problems with both natural and urban contexts.

Arch 302 Architectural Design 4 (0-12) Prereq Arch 301; c/w in Arch 309. Continuation of Arch 301. Program analysis; conceptual and definitive design of small- to medium- to large-scale architectural projects within the contemporary social and technological context.

Arch 303 Architectural Design Determinants 2 Prereq major in Arch; c/w in Arch 301. Natural and human systems and technical factors affecting physical planning and architectural design.

Arch 304 Architectural Design Determinants 2 Prereq Arch 307; c/w in Arch 303. Factors affecting the design of small- to medium-scale architectural projects within contemporary and technological context.

Arch 323 Ancient to Medieval Architecture 2 Prereq major in Arch. Development of western architecture from prehistory to late medieval; social, technical, and scientific influences.

Arch 324 Renaissance to 19th Century Architecture 2 Prereq Arch 323. Western architecture from the Renaissance and Baroque to the pioneers of the modern movement.

Arch 331 Materials and Construction I 3 Prereq Arch 101. Properties of building materials and construction applications.

Arch 332 Materials and Construction II 3 (2-3) Prereq major in Arch or Cat M. Theory and application of various construction systems and materials; wood, masonry, concrete, steel utilizing contemporary communication.

Arch 342 Urban Theory 3 Prereq junior in Arch or Cat M. Principles and theories of urban and regional planning.

Arch 351 Architectural Structures I 3 Prereq junior in Arch or Cat M. Introduction to statics and mechanics; analysis and design of statically determinate architectural structures using timber, steel, and reinforced concrete systems.

Arch 352 Architectural Structures II 3 Prereq Arch 351. Continuation of Arch 351. Design, analysis, and construction of various types of structures.

Arch 353 Architectural Structures Lab I 1 (0-2) Prereq Arch 351 or c/w. Design principles of architectural structures systems; available systems for spanning and enclosing architectural space.

Arch 354 Architectural Structures Lab II 1 (0-2) Prereq Arch 352 or c/w. Continuation of Arch 353.

Arch 360 Reading Examination V 1-3 Prereq major in Arch or Cat M. Reading and understanding reading from lists prepared by the school.

Arch 401 Architectural Design 5 (0-10) Prereq Arch 303; c/w in Arch 407. Program analysis; conceptual and definitive design of medium- to large-scale architectural projects within contemporary social and technological context.

Arch 402 Architectural Design 5 (0-15) Prereq Arch 401; c/w in Arch 409. Contextual analysis; planning; conceptual and definitive design of community- or city-scale projects or institutions.

Arch 403 Architectural Design Determinants 2 Prereq Arch 309; c/w in Arch 401. Factors affecting the design of large- to medium-scale architectural projects within contemporary social and technological context.

Arch 404 Architectural Design Determinants 2 Prereq Arch 407; c/w in Arch 403. Factors affecting the planning and design of community- or city-scale projects or institutions.

Arch 411 Architectural Design 6 (0-18) Prereq Arch 403; c/w in Arch 415. Integration of architectural determinants; programming, space and site plans, physical science, interiors and landscaping.

Arch 412 Terminal Design Project 6 (0-12) Prereq Arch 411, 415. Architectural project selected by the student and approved by the faculty.

Arch 413 Programming and Decision Theory 2 Prereq Arch 411. Issues involved in organizing the information for design; collection, organization, and preparation of program for terminal project.

Arch 423 Twentieth Century Architecture 2 Prereq Arch 324. History from the modern movement to today; principles of architectural design demonstrated in the work of 20th century architects.

Arch 424 Conservation of Historic Buildings 2 Prereq Arch 324. Theory and practice of architectural conservation; maintenance, repair, restoration, adaptive reuse; historic districts; incentives.

Arch 425 Architectural Theory I 2 Prereq Arch 423. Architectural criticism and evaluation as viewed from contemporary and historical precedents.

Arch 426 Architectural Theory II 2 Prereq Arch 423. Theory development and its effect on the design process.

Arch 432 Environmental Control of Buildings 3 (2-2) Prereq major in Arch or Cat M. Building heating, ventilating, air conditioning systems, large and small scale; heat flow concepts; plumbing and water supply systems.

Arch 433 Environmental Control of Buildings I 3 (2-2) Prereq Arch 432. Building lighting, performance criteria and design; electrical distribution for large and small buildings, vertical transportation; building communication systems.

Arch 434 Acoustics 1 Prereq major in Arch or Cat M; Phys 101, 102; Math 107. Sound theory, control, acoustics, and reinforcement systems as applied to architectural problems.

Arch 437 Energy Use in Buildings 2 Prereq Arch 432. Energy use in contemporary buildings; conservation and alternate energy sources.

Arch 461 Architectural Structures III 3 Prereq Arch 303, 352. Wind and seismic loads on architectural structures; high-rise structure systems; reinforced masonry systems, earth retaining structures and foundation systems.

Arch 462 Architectural Structures IV 3 Prereq Arch 401, 352. Deflection theory; analysis of statically-determinate structural systems; case studies in preliminary architectural engineering for buildings.

Arch 471 Architectural Economics 3 Prereq senior in Arch. Theory and practice of cost benefit analysis applied to architectural systems.

Arch 472 Construction Communications/Costs/ Codes 2 Prereq major in Arch. Design and construction delivery systems; codes, costs, specifications, manuals, and contract documents.

Arch 473 Architectural Business 2 Prereq Arch 472. Architect licensing process; techniques for and rationale of marketing architectural services; office organization and business methods applied to architectural practice.

Arch 480 Architecture Internship V 1-16 May be repeated for credit; cumulative maximum 16
hours. Prerequisite major in Arch or Cst M. Placement in an approved industrial, professional, or governmental situation for specialization or general experience.

490 Seminar in Architectural Design V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prerequisite major in Arch. Advanced study in architectural design.

491 Seminar in Architectural Communications V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prerequisite major in Arch. Advanced study in architectural history.

492 Seminar in Architectural History V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prerequisite major in Arch. Advanced study in architectural history.

493 Seminar in Environmental Control V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prerequisite major in Arch or Cst M. 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. Prerequisite Arch 342. Advanced study in urban and regional planning.

495 Seminar in Construction Management V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prerequisite senior in Cst M. Advanced study in construction management.

496 Seminar in Computer Applications V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prerequisite Cpt S 151, 153, 154, or 203. Architectural and construction applications of computer graphics, management, computer-aided design.

497 Seminar in Professional Practice V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prerequisite senior in Arch. Advanced study in architectural practice management.

498 Seminar in Architectural Structures V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prerequisite Arch 301, 351 or C/. Advanced study in architectural structures systems.

499 Special Problems V 1-4 May be repeated for credit.

510 Research Methods 2 Research methods in energy and resource management; planning and methodologies of research; historical, survey, and experimental systems.

520 Directed Topics in Architecture V 1-3 May be repeated for credit; cumulative maximum 6 hours. Energy and resource management; design, environmental controls, materials, construction systems, and life cycle costs.

540 History and Theory of Energy and Resource Management in Architecture 3 Interrelationship between energy resources, technology, and related human and societal needs with architecture and the built environment.

570 Advanced Architectural Laboratory 5 (0-12) Human, societal, environmental, and the technological factors relevant to energy and resource issues in architectural design.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination. Variable credit.

Description of Courses

For explanation see Index under "Symbols"

Construction Management

Cst M

451 Construction Practice Management I 2 Prerequisite senior in Cst M. Construction industry organization and ethics; contract documents, their relationships, meanings, and significance in construction.

452 Construction Practice Management II 3 Prerequisite Cst M 451. Continuation of Cst M 451.


454 Construction Project Management Lab I (0-3) Prerequisite Cst M 452 or C/. Construction project management; techniques and rationale for project planning, organizing, directing, and controlling.

455 Critical Path Management Techniques 1 Prerequisite senior in Cst M or Arch. Architectural and construction applications for network programming and scheduling techniques.

470 Construction Estimating 3 Prerequisite senior in Cst M. Cost estimating related to building general construction work; methods and techniques applicable to quantity survey and detailed estimates.

495 Seminar in Construction Management V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prerequisite senior in Cst M. Advance study in construction practice management.

499 Special Problems V 1-4 May be repeated for credit.

General Requirements

1. Students who wish to transfer from another institution may find it possible to take some or all of the first two years elsewhere. See the WSU bulletin, Transfer Programs for Community Colleges, for contact in the School of Architecture for information.

2. A student may not take any courses required by the school on a pass-fail basis.

3. Under no circumstances may a student be enrolled in 300- or 400-level architecture courses without acceptance into and certification as a major in either Architecture or Construction Management.

4. Due to limitations of space and faculty, certification as a major in Architecture or Construction Management can be granted to only the most qualified students. For Architecture, selection is based on the satisfaction of minimum requirements, overall grade point, and demonstrated abilities. For Construction Management, selection is based on satisfaction of minimum requirements and overall grade point.

Prospective applicants for certification are responsible for acquainting themselves with all requirements and procedures.

Schedule of Studies

BACHELOR OF ARCHITECTURE

Pre-Architecture

Students who enter WSU as freshmen and have an interest in architecture should obtain an adviser in the School of Architecture through the Curriculum Advisory Program.

Students must complete 60 hours and 2 years of college-level work including the following:

Freshman Year

First Semester  Hours
Math 107 and/or 108  2-5

Second Semester  Hours
Math 171 or 206  4-3
Arch 102 Graphic Communication  3
Com Prof GUR  3
Arch 202 Built Environment  3
Elective  3

Sophomore Year  Hours
First Semester
Phys 101 or 201  4
Arch 201 Intro Design  3
Arch 331 Mat and Const  3
Soc S GUR  3
Elective  3

Second Semester
Phil S Elective  3-4
Arch 203 Intro Design II  3
Hum GUR  3
Intercultural Studies GUR  3
Elective  3

Professional Program

Upon completion of the Pre-Architecture program requirements or their equivalents for transfer students, application must be made for admission to the third year Professional Program (see requirements below). Successful completion of the three-year Professional Program requirements totaling 90 semester credits minimum, lead to the degree of Bachelor of Architecture. This accredited degree plus three additional years of professional experience and successful completion of the architectural license examination qualifies a person for registration as a licensed architect in the state of Washington.

Professional Program Entry Requirements

1. Satisfactory completion of all Pre-Architecture requirements or their equivalents including 60 semester credits total.

2. Submission of application for entry. Forms and instructions for application are available from the Office of Admissions and must be submitted prior to February 1 preceding fall registration. Transfer students must also submit Application for Admission to the university. Successful applicants will be notified prior to May 1.

NOTE: Satisfactory progress in the Professional Program requires a grade of C or better be earned in all architectural design and determinants courses in the third, fourth, and fifth years.

Junior Year  Hours
First Semester
Arch 301 Design  4
Arch 307 Determinants  2
Arch 323 History  2
Arch 395 Lecture/Shop  2
Arch 311 Introduction to Structural Analysis  2
Arch 351 Structures I  3
Arch 333 Struct Sem I  1
Elective  3

Second Semester
Arch 303 Design  4
Arch 309 Determinants  2
Arch 324 History  2
Arch 395 Lecture/Shop  2
Arch 352 Structures II  3
Arch 354 Struct Sem II  1
Arch 432 Env Control I  3
Upon completion of the Pre-Architecture (Construction Management) Program requirements, or on their equivalent for transfer students, application must be made for certification into the Construction Management program.

**Pre-Construction Management**

**Newman Year**
- **Freshman Year**
  - **First Semester**
    - Math 107
    - Math 108
    - Arch 101 Graphic Comm 1
    - Humanities GUR
    - Phys 101 General
  - **Second Semester**
    - Com Prof GUR
    - Math 206 Math Arch
    - Econ 102 Economics
    - Humanities GUR
    - Science GUR

**Sophomore Year**
- **First Semester**
  - Acct 230 Accounting
  - Econ 202 Economics
  - Cpt S 105
  - Com Prof GUR

**Certification Requirements**
- Satisfactory completion of a minimum of 43 semester credits including those courses or their equivalents in the first three semesters below.
- Must have passed the following courses with a grade of "C" or better: Arch 101, Phys 101, and Acct 230.
- Must submit the "Academic Record" form and other required data. Form and instructions for application are available from the Office of Admissions and must be submitted prior to December 1 preceding spring registration.
- Transfer students must also submit an Application for Admission to the university. Successful applicants will be notified prior to the beginning of spring semester.

**Construction Management**
- **Second Semester**
  - Acct 231 Accounting
  - B Law 210 Bus Law
  - Arch 331 Mat and Const I
  - C E 101 Surveying
  - Arch 495 Const Mgmt Seminar
  - Intercultural Studies GUR

**Junior Year**
- **First Semester**
  - Arch 351 Structures
  - Ins 320 Insurance
  - Arch 434 Acoustics
  - Arch 322 Mat and Const II
  - R E 305 Real Estate
  - Cpt S 153 Basic Programming

**Second Semester**
- Arch 352 Structures
- Arch 432 Env Control I
- Fin 325 Finance
- Cst M 455 CPM in Const
- Cst M 470 Const Estimating
- Elective

**Senior Year**
- **First Semester**
  - Cst M 451 Const Pract Mgmt
  - Approved Personnel Elective

**Asia Program**

Associate Professor and Director, F. W. Blackwell (South Asia); Professors, T. Akamine (Education, East Asia), V. N. Bhatia (International Education, South Asia), D. H. Bishop (Philosophy, Asia General), A. Chang (Chinese, Japanese), T. L. Kennedy (History, East Asia), T. Terunuma (Politic Science, East Asia), Professor Emeritus, A. H. Smith (Anthropology, East Asia); Associate Professors, D. A. Menzinger (Anthropology, South Asia), A. S. Richart (Child and Family Studies, Developing Countries); Assistant Professors, G. Nomura (History, East Asia); L. Stone (Anthropology, South Asia); Librarians, R. Kwon (East Asia), A. M. Spritzer (South Asia).

The Asia Program is designed to provide a broad, systematic knowledge of Asia through interdisciplinary study and is intended to serve four major objectives:
- (1) to prepare students intending to teach courses on Asia in public schools,
- (2) to provide academic background for those planning to pursue graduate work on Asia,
- (3) to prepare students for business careers dealing with Asia, and
- (4) to train those interested in governmental and various private career opportunities related to Asia.

The flexibility of the program affords both an area concentration and a departmental specialization. The program offers the degree of Bachelor of Arts in Asian Studies.

**Description of Courses**

For explanation see Index under "Symbols"

**Asia**

101 Introduction to Contemporary China 3 Lectures, films, and discussions on selected aspects of contemporary China.

270 [K] Introduction to South Asian Culture 3 Same as Hist 270.

275 [K] Introduction to East Asian Culture 3 Same as Hist 275.

303 Elementary Hindi 4 Same as For L 303.

304 Elementary Hindi 4 Same as For L 304.

310 [G] Eastern Civilization and Literature 3 Same as For L 310.

314 [I] Philosophy and Religion of India 3 Same as Phil 314.

315 [I] Philosophy and Religion of China and Japan 3 Same as Phil 315.

329 Peoples of Asia 3 Same as Anth 329.

552 Gandhi and Twentieth Century India 3 Same as For L 552.

373 [G] Chinese Civilization 3 Same as Hist 373.

374 [I] Pre-Modern History of East Asia 3 Same as Hist 374.

435 Politics of Developing Nations 3 Same as Pol S 435.
Degree Requirements

MAJOR:
A minimum of 42 hours of courses on Asia and in related fields including (1) two years of an Asian language or languages and (2) at least six hours in both East Asia and South Asia, which must include the core courses of Asia 270 and 275. Of the total 42 hours, at least 36 must be at the 300 level or above. Also required is a minor (or second major) in a discipline (i.e., department) or a program (e.g., Asian Studies, Religious Studies).

East Asia
Ath 123 Peoples of East Asia 3
Asia 275 Intro East Asia 3
Asia 315 Phil of China, Japan 3
Asia 435 Politics SE Asia 3
Asia 436 Politics of China, Japan 3
Asia 476 Revol China 3
Asia 477 Modern Japan 3
Chin 301 Chinese I 3
Chin 302 Chinese II 3
Chin 303 Intensive Chinese 3
Chin 401 Chinese III 3
Japa 301 Japanese I 3
Japa 302 Japanese II 3
Japa 303 Intensive Japa 3
Japa 401 Japanese III 3

South Asia
Asia 270 Intro South Asia 3
Asia 310 Eastern Civ 3
Asia 312 Gandhi 20C India 3
For L 300 Sanskrit 3
For L 300 Sanskrit 3
Asia 303 Elem Hindi 3
Asia 304 Elem Hindi 3
Asia 315 Phil Rel India 3

Asia, General
Asia 329 Peoples Asia 3
Asia 499 Special Problems 1-4

Electives
Mgt 301 Bus Org 3
Mgt 452 Intern Bu Mgmt 3
Mgt 453 Comm Mgmt U.S./Japan 3
Econ 416 Comp Econ Syst 3
Econ 470 Internatl Trade/Fin 3
Econ 472 Develop Underdev 3

Relevant upper-division courses not mentioned above may be counted toward a major or minor if approved by the Director of the Asia Program.

MINOR:
A minor in Asian Studies requires 20 hours, including 8 hours of an Asian language and 12 hours from the list below, with at least one course in three of the following disciplines: Anthropology, History, Humanities, Philosophy, Political Science.

Ath 329 Peoples of Asia Hist 270 Introduction to South Asia

Asian/Pacific American Studies
Assistant Professors, G. Nomura, S. Sumida.
Asian/Pacific American Studies offers an interdisciplinary study designed to provide a broad, systematic understanding of Asian/Pacific Americans, related to yet distinct from the traditional cultures of their forebears.

This program serves the following objectives: (1) An understanding of the humanistic, historical, social, economic, psychological, and political forces which have shaped Asian/Pacific American cultural heritages; (2) A review of the issues confronting contemporary Asian/Pacific American communities; (3) The development of resource materials for further in-depth research and study of the Asian/Pacific American experience.

A minor in Asian/Pacific American Studies is offered. The minor requires 17 hours of credit chosen from the list below, including: (1) a minimum of 8 hours at the 300-level and above; and (2) 9 hours from the following core courses:

APAS 201, 205, 301, 311, 312, 495.

Description of Courses

For explanation see Index under "Symbols"

APAS 201 [K] Introduction to Asian American History 3 Historical experience of Asian/Pacific Americans from the 19th century to 1965.

APAS 203 [S] Peoples of the World 3 Same as Anth 203.

APAS 205 Socio-Cultural Analysis of Asian American Communities 3 Multidisciplinary analysis of Asian/Pacific American community development, structures, and issues; compares and contrasts new emerging communities with the old.

APAS 275 [K] Introduction to East Asian Culture 3 Same as Hist 275.

Contemporary Issues, 1965-Present 3 Social, psychological, political, economic, educational, and cultural issues which shape Asian/Pacific American identity and community today.

[O] Asian American Literature 3 Asian American fiction, drama, poetry, and other arts, 1900-present; impact of Asian/Pacific American culture and experience upon these works.

Hawaii/Pacific American Literature 3 Indigenous and immigrant American literatures, cultures, and histories of Hawai and the Pacific from 1778 to the present.

Philosophy and Religion of China and Japan 3 Same as Hist 315.

United States 1941-Present 3 Same as Hist 419.

Program in Astronomy

Professor and Program Head, T. E. Lutz; Professors, J. H. Lutz, A. Marcus; Assistant Professor, B. Srinivasan.

Astronomy is the study of celestial bodies including the sun, planets, satellites, stars, and galaxies. The various courses offered in astronomy are intended to provide background for both liberal arts and science majors. The astronomy faculty are part of the Department of Pure and Applied Mathematics. The WSU Planetarium and the Jewett Observatory are used as instructional aids in astronomy courses.

A minor in astronomy requires 16 hours as follows: a minimum of 10 hours upper-division astronomy courses which must include Astr 345 and at least one hour of Astr 499; 6 hours from Cpt S 330; Hist 381; Math 440, 441, 448; Phys 320, 341, 342, 443, 450; Star 430.

Description of Courses

For explanation see Index under "Symbols"

Astr 135 [P] Descriptive Astronomy 3 Physical characteristics and motions of the bodies of the solar system, stars, nebulae, and galaxies. Credit not granted for both Astr 135 and 345.


Astr Principles of Astronomy 3 Prereq Phys 102 or 202. Planets, the sun, stars, and galaxies; current topics in astrophysics and planetary research. Credit not granted for both Astr 135 and 345.

Astr Aspects of the Night Sky 1 Prereq Astr 135 or 345 or Hist 381. Star names, magnitude scales, constellation identification and mythology, astronomical coordinates, solar, lunar, and planetary motions, practical astronomy.

Astronomy and Astrophysics 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Math 172. Advanced topics in modern astronomy and astrophysics.

Astr Special Problems 1-4 May be repeated for credit.

Astr Topics in Modern Astrophysics 3 May be repeated for credit; cumulative maximum 9 hours. Prereq Math 315. Problems of current astrophysical interest in the areas of stellar atmospheres, stellar interiors, gaseous nebulae, the interstellar medium and galaxies.

Astr Special Projects or Independent Study Variable credit.
Program in Biochemistry and Biophysics

**Program in Biochemistry and Biophysics**

Professor and Program Chair, J. A. Magnuson; Professors, R. W. Brosmer, R. Croteau, A. K. Dunker, M. D. Griswold, G. L. Hazeltine, F. Loewus, B. A. McFadden, M. L. Pail, L. L. Randall, O. R. Reeves, C. A. Ryan, R. G. Yourt; Associate Professors, K. J. Foster, M. J. Smerdon; Assistant Professor, T. W. Okiwa.

Biochemistry and biophysics are interdisciplinary sciences which involve the application of methods and theories of chemistry and physics to the study of biological phenomena. The Program in Biochemistry and Biophysics includes faculty from chemistry, the Institute of Biological Chemistry, and genetics and cell biology. Its purpose is to provide the specialized guidance and training necessary for students who wish careers in these modern areas of science. In addition, special options are available for students interested in premedicine, dentistry, and preventive science.

Program members are all active in research and have interests in: function and mechanism of contractile proteins, nuclear magnetic resonance studies of membranes and proteins, DNA repair mechanisms and chromatin structure, the structure and function of membrane components, control of eucaryotic gene expression, evolution of macromolecules, the biosynthesis and metabolism of waxes, isopentols, monoterpenes, and other plant components, the structure and function of plant proteinases, microbial metabolism and its regulation, evolution and function of the enzyme isocitrate lyase, nematode development, the role of metabolites in animal diseases, mechanisms of hormonal control in animal systems, biorheology of the immune response, cell regulation by cyclic nucleotides, photosynthesis, structure and biosynthesis of hydrocarbons, structure and function of fatty acid synthetase, chemotaxis, synthesis and export of bacterial cells.

Undergraduate students interested in biochemistry should obtain a general background in biology, physics, chemistry, and mathematics during their freshman and sophomore years.

Students interested in biophysics should obtain similar basic preparation and, during the junior and senior years, advanced courses in related fields, e.g., physics, chemistry, or biochemistry. Within the major of biochemistry, pre-medical, dental, or veterinary medicine options are available.

The undergraduate minor in biochemistry requires one semester analytical chemistry course with laboratory and two semesters of organic chemistry with laboratories each semester. In addition, the minor requires BC/BCP 364 plus 5 additional units of biochemistry/biophysics (excluding BC/BCP 463 or 464), 2 units of which must include laboratory courses. (BC/BCP 463 plus 464 may be used to satisfy the requirement for 10 units of biochemistry/biophysics.)

The program offers courses of study leading to the degrees of Bachelor of Science in Biochemistry, Master of Science in Biochemistry, and Doctor of Philosophy. 

**Description of Courses**

For explanation see Index under "Symbols"

**BC/BCP**

364 Introductory Biochemistry 3 Prereq Chem 106 and 107; Chem 240 or 340. Modern biochemistry for undergraduates in the biological sciences.

463 Introductory Biochemistry Laboratory 1 (0-3) Prereq BC/BCP 364 or c/. Basic biochemical techniques.

466 General Biochemistry 3 Prereq Chem 220, 222, 342. Open only to juniors and seniors. Protein structure and function; enzymes; catalysis; nuclear acid structure and function; biochemical methodology; molecular biology.

468 General Biochemistry 3 Prereq BC/BCP 463. Metabolism of carbohydrates, proteins, fats, bioenergetics; photosynthesis; control of metabolic processes.

472 Principles of Biophysical Chemistry 3 Prereq Chem 331. Transport processes; elementary quantum theory; chemical bonding; principles and applications of spectroscopy of macromolecules; statistical mechanics.

482 Biophysical Chemistry Laboratory 2 (0-6) Prereq BC/BCP 472 or c/. Laboratory experiments illustrating physical chemical principles with particular application to life sciences.

499 Special Problems V 1-4 May be repeated for credit.

560 Molecular Genetics 3 Same as GenCB 560.

561 Biochemistry of Hormones and Hormone Receptors 3 Prereq BC/BCP 563. Mechanisms of action of steroid and peptide hormones; methodology used in hormone research. (a/y)


564 General Biochemistry 3 Prereq BC/BCP 563. Carbohydrate, amino acid and lipid metabolism and its control; biochemistry of vitamins, bioenergetics, photosynthesis, nitrogen fixation.

567 Proteins and Enzymes 3 Prereq BC/BCP 563. Enzyme mechanisms; protein structure and function; protein evolution. (a/y)

568 Advanced Topics in Biochemistry V 1-3 May be repeated for credit. Prereq BC/BCP 564. Recent research in selected areas of biochemistry.

569 Nucleic Acid Biochemistry 3 Prereq BC/BCP 563. Chemical and biological properties of DNA and RNA; enzymes acting on nucleic acids and current experimental methods. (a/y)

570 Biocomputers 2 3 Prereq BC/BCP 563, 564. Structure and function of biological membranes; composition, transport, receptors, and sensory phenomena. (a/y)

573 Physical Biochemistry 3 Prereq BC/BCP 472 or 1 yr physical chem. Techniques for the study of biological structure and function; spectroscopy, magnetic resonance, diffusion, and sedimentation, electron microscopy, diffusion and scattering.

574 Physical Biochemistry 3 Prereq 1 yr physical chem; BC/BCP 573. Principles relating to biological structure and function; use of biophysical techniques to examine problems of current interest.

575 Molecular Biology Techniques I 1 (0-3) Prereq BC/BCP 564 or c/. Modern laboratory techniques in the isolation and characterization of proteins.

576 Molecular Biology Techniques II 1 (0-3) Prereq BC/BCP 564 or c/. Modern laboratory techniques in the sequencing of nucleic acids.

577 Molecular Biology Techniques III 1 (0-3) Prereq BC/BCP 564 or c/. Modern laboratory techniques in the use of plasmids as cloning vehicles.

581 Advanced Topics in Plant Biochemistry 1 Prereq BC/BCP 563, 564; basic botany. Biochemistry unique to plants; new research advances. (a/y)

582 Basic Research Seminar V 1-2 May be repeated for credit; cumulative maximum 10 hours. Required of all graduate students in biochemistry.

583 Advanced Topics in Cell Biology V 1-3 May be repeated for credit; cumulative maximum 7 hours. Same as GenCB 592.

584 Research Proposal 2 May be repeated for credit; cumulative maximum 4 hours. Written and oral presentation of an area of biochemistry.

585 Special Projects or Independent Study Variable credit.

701 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

**Schedule of Studies**

At least 40 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

**Freshman Year**

**First Semester**

Chem 105 Principles 4
Bio S 103 Introductory 4
Engl 101 Composition 3
Math 107 PreCalculus 3
Hum or Soc S Elective 3

**Second Semester**

Chem 106 Principles 4
Chem 107 Qual Analysis 2
Bio S 104 Introductory 4
Math 171 Calculus I 4
Engl 201 Expository Writing 3

**Sophomore Year**

**First Semester**

Chem 340 Organic 3
Chem 341 Organic Lab 2
Chem 220 Quant Analy 2
Chem 222 Quant Analy Lab 2
Math 172 Calculus II 4
Hum or Soc S Elective 3

**Second Semester**

Chem 342 Organic 3
Chem 343 Organic Lab 2
Phys 201 Class Phys 4
BC/BCP 364 Intro Biochem 3
Hum or Soc S Elective 4

**Junior Year**

**First Semester**

Phys 202 Class Phys 4
Chem 331 Phys Chem GenCB 301 General 3
Foreign Language 4

**Second Semester**

BC/BCP 472 Biophys Chem 3
BC/BCP 482 BP Chem Lab 2
Bio S Electiveforeign Language 3-4
Hum or Soc S Elective 3
Program in Black Studies

Associate Professor, T. Anderson; Assistant Professors, D. Culveron, E. Smith.

The Black Studies Program examines from an interdisciplinary approach the historical, social and political behavior and economic experience of Afro-Americans and peoples of African descent throughout the world. The program teaches the history of Afro-Americans and their contemporary status; the form and meaning of the artistic expression of Afro-Americans and Africans; and the similarities, distinctions, and interaction between peoples of European and of African descent in America.

The program is committed to the functions of teaching, research, and community service which serves to prepare the student for career opportunities in the social and behavioral sciences, and in the arts and humanities. Students majoring in Black Studies and minoring in another area can move professionally into related fields of graduate study offered by the university. Elected Black Studies courses provide non-majors the opportunity to acquire knowledge of Black people in the Americas, Africa, and the Caribbean. The courses might also provide teachers with the background and training to teach Black-oriented courses.

The course of study leads to the degree of Bachelor of Arts in Black Studies.

Description of Courses

For explanation see Index under "Symbols"

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<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BI St 101</td>
<td>S1</td>
<td>Introduction to Black Studies</td>
</tr>
<tr>
<td>BI St 102</td>
<td>S2</td>
<td>Visual Arts</td>
</tr>
<tr>
<td>262</td>
<td>Music of Black Americans</td>
<td>3</td>
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</tbody>
</table>

310 Afro-American History I 3 Historical experiences of Blacks in America from 1619 to 1899.
311 Afro-American History II 3 Same as Hist 311.
313 Civil Rights Movement in America 3 Historical development and analysis of the Civil Rights Movement in the United States from 1900 to present.
314 African History and Cultures 3 Historical development of Africa from the era of conquest to colonization and independence.
319 Black Literature in America 1700-1900 3 Survey of Black literature covering the 18th century to early 1900.
320 Black Literature in America, 1900 to Present 3 Same as Engl 320.
324 Black Politics 3 Same as Pol S 324.
370 Topics in Black Studies 3 Contemporary social, economic, political, and historical issues which affect the life and experience of Blacks in the U.S.
381 Sociology of Black Americans 3 Same as Soci 381.
424 South Africa: From Pre-European Settlement to Present 3 Prereq junior or senior standing.
454 Black Family in America 3 Sociological examination of Black family in America from slavery to the present.
474 African Politics 3 Historical, economic, and social factors that shape contemporary African political systems and problems of nation-building.
491 Education and Social Change in Africa 3 The role of education in the social, political, and economic changes in African countries; African education and the modernization process.
498 Seminar in Black Studies Theory and Writing Methods 2 Prereq BI St 101. Analysis and discussion of readings in Black studies; research and writing.
499 Special Problems V 1-4 May be repeated for credit.

Schedule of Studies

A Bachelor of Arts degree in Black Studies requires at least 37 hours in Black Studies. A minor in Black Studies requires a minimum of 18 hours including BI St 101, 311, 314, and 381. Additional hours in Black Studies may be elected by the student with the advice of the Program Advisor. At least 40 of the total hours required for the bachelor’s degree in this program must be upper-division courses. Students planning to transfer to this program should have completed all General University Requirements.

 Majors are advised to complete BI St 101 during the freshman and sophomore years in addition to General University Requirements.

In addition majors are required to take the following upper-division courses:

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<tr>
<th>Course Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>BI St 310</td>
<td>Afro-American History I</td>
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<tr>
<td>BI St 311</td>
<td>Afro-American History II</td>
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<td>BI St 314</td>
<td>African History Cult</td>
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<td>BI St 319</td>
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<td>BI St 320</td>
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<tr>
<td>BI St 324</td>
<td>Black Politics</td>
<td>3</td>
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<tr>
<td>BI St 370</td>
<td>Topics in Black Studies</td>
<td>3</td>
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<tr>
<td>BI St 381</td>
<td>Soc Black Amer</td>
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<tr>
<td>BI St 410</td>
<td>Ethnic Groups Pub Educ</td>
<td>3</td>
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Recommended electives for program majors and minors: BI St 262, 301, 302, 313, 345, 354, 350, 320, 321; and Engl 491.

Department of Botany


Botany is the basic plant science. The courses offered in the department are designed to meet the needs of three groups of students: (1) those planning to specialize in an applied science such as agronomy, bacteriology, forestry, horticulture, pharmacy, plant pathology, range management, and wildlife biology; (2) those wishing to study a biological science for its cultural or educational value; and (3) those who plan to specialize in botany. Those in the first group will desire to obtain as comprehensive a knowledge of the field as time will permit. The second group may find one year of introductory work sufficient. For the third group the department offers courses leading to advanced degrees in botany.

The department has laboratories and equipment suitable for graduate study in the major areas of botany, and special facilities for work in the fields of biochemistry, biophysics, physiology, chemotaxonomy, cytotaxonomy, anatomy, developmental morphology, ecology-population biology, and ultrastructure.

The department offers courses of study leading to the degrees of Master of Science in Botany and Doctor of Philosophy.

Description of Courses

For explanation see Index under “Symbols”

Bot

120 [B] Introduction to Botany 3 (3-3) A survey of the plant kingdom; structure and function of vascular plants.
320 Introductory Plant Physiology 3 (2-3) Prereq Bio S 104 or Bot 120; Org Chem. Water relations, mineral nutrition, photosynthesis, respiration, and growth of plants.
332 Systematic Botany 4 (2-6) Prereq Bio S 101 or 103. Identification and classification of seed plants represented in local flora.
405 Principles of Organic Evolution 2 Same as Zool 405.
410 Microtechnique 4 (2-6) By interview only. Modern methods for preparation of biological specimens for microscopy; paraffin and resin embedding, histological, and histochemical techniques. Credit not granted for both Bot 410 and 510. (a/y)
411 Plant Morphology 4 (3-3) Prereq Bio S 104 or Bot 120. The morphology and phylogeny of the algae, fungi, bryophytes and vascular plants. (a/y)
420 Aquatic Macrophytes 1 Prereq Bot 120, 332. Classification, structure, and habitats of predominant aquatic macrophytes of Pacific NW. Field trip required. Credit not granted for both Bot 420 and 520. Cooperative course taught at the University of Idaho (Bot 1D420).
421 General Mycology 4 (2-6) Same as PL P 421. (a/y)
426 Morphology of Embryophytes 4 (2-6) Prereq Bot 120. Structure, life history, classification, and phylogeny of liverworts, mosses, clubmosses, horsetails, quillworts, ferns, and gymnosperms. Field trip required. Credit not granted for both Bot 426 and 526. Cooperative course taught at the University of Idaho (Bot ID426).

429 (329) General Plant Pathology 3 Same as PL P 429.
430 Principles of Plant Systematics 3 Prereq Bot 332. Systematics of vascular plants: description, evolution, classification, nomenclature and current theory. Credit not granted for both Bot 430 and 530. (a/y)
436 Agrostology 3 (1-6) Prereq Bot 332. Classification and identification of grasses and grass-like plants. Credit not granted for both Bot 436 and 536. (a/y)
448 Evolutionary Ecology of Populations 3 Same as Zool 448. Credit not granted for both Bot 448 and 548.
450 Cell Biology 3 Same as GenCB 450.
460 Ecophysiology 3 Prereq Bot 320; Bio S 372. Relationships of biotic and abiotic environment to plant distribution and evolution through study of physiological processes. Credit not granted for both Bot 460 and 560.
499 Special Problems V 1-4 May be repeated for credit. Prereq 20 hrs Bot.
500 Seminar 1 May be repeated for credit. Prereq 20 hrs Bot.
504 Plant Physiology—Stress Physiology 1 Prereq Bot 320. Temperature, water, and salinity effects on physiological processes; mechanistic understanding of stress.
506 Plant Physiology—Nitrogen Metabolism in Plants 1 Prereq Bot 320; BC/UP 364. Symbiotic nitrogen fixation, uptake, assimilation, translocation, metabolic and physiological roles of nitrogen in plants.
507 Transmission Electron Microscopy 4 (2-6) Same as course taught at the University of Idaho. Credit not granted for both Bot 507 and 508. (a/y)
510 Microtechnique 4 (2-6) Graduate level counterpart of Bot 410; additional requirements. Credit not granted for both Bot 410 and 510. (a/y)
512 Growth and Development 3 Prereq Bot 320. Physiology of growth; metabolism during development and reproduction.
514 Photosynthesis, Photoreproduction, and Plant Productivity 3 Prereq Bot 320 or BC/UP 364. Photosynthetic processes and the interrelationship of those biochemical, physiological, and environmental factors which determine plant productivity.
516 Experimental Methods in Plant Physiology 3 (2-3) Prereq Bot 320. Advanced techniques and instrumental methods applicable to research in plant physiology. (a/y)
520 Aquatic Macrophytes 1 Graduate level counterpart of Bot 420; additional requirements. Credit not granted for both Bot 420 and 520. Cooperative course taught at University of Idaho (Bot ID520).
525 Experimental Plant Ecology 3 (1-6) Same as ZFM 525. Morphology of Embryophytes 4 (2-6) Graduate level counterpart of Bot 426; additional requirements. Credit not granted for both Bot 426 and 526. Cooperative course taught at the University of Idaho (Bot ID526).
530 Principles of Plant Systematics 3 Graduate level counterpart of Bot 430; additional requirements. Credit not granted for both Bot 430 and 530. (a/y)
533 Modern Methods in Systematics 4 (2-6) Prereq Bot 430 or Zool 511. Selecting, gathering, and analyzing morphological, cytological, chemical data for taxonomic and evolutionary studies. (a/y)
535 Angiosperm Families of the World 3 (2-3) Prereq Bot 332 or 430. Description, classification, and geographic distribution of families of flowering plants of the world. (a/y)
536 Agrostology 3 (1-6) Graduate level counterpart of Bot 436; additional requirements. Credit not granted for both Bot 436 and 536. (a/y)
548 Evolutionary Ecology of Populations 3 Same as Zool 548. Graduate level counterpart of Bot 448; additional requirements. Credit not granted for both Bot 448 and 548.
551 Plant Anatomy 4 (2-6) Graduate level counterpart of Bot 451; additional requirements. Credit not granted for both Bot 451 and 551.
556 Physiology 4 (2-6) Prereq Micro 201 or Bot 120. Biology of the algae; systematic, morphological, physiological, cytology, and ecology of algae with emphasis on freshwater forms. (a/y)
560 Ecophysiology 4 Graduate level counterpart of Bot 460; additional requirements. Credit not granted for both Bot 460 and 560.
562 Community Ecology 3 Graduate level counterpart of Bot 462; additional requirements. Credit not granted for both Bot 462 and 562.
563 Field Ecology 2 (0-6) Graduate level counterpart of Bot 463; additional requirements. Credit not granted for both Bot 463 and 563.
564 Plant Geography 3 Prereq Bot 332, 460 or 462. Origin and distribution of major units of terrestrial vegetation; emphasis on North American. (a/y)
576 Paleontology 4 (3-3) Same as Anth 576.
590 Advanced Topics in Botany V 1-4 May be repeated for credit. Recent research in plant science. (a/y)
600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.
702 Master's Special Problems, Directed Study, and/or Examination Variable credit.
800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Preparation for Graduate Study
Before undertaking graduate study, a student should have completed substantially the equivalent of the schedule of studies shown under the General Biology Program for the Botany option.

Undergraduate majors in such subjects as the applied plant sciences, the biological sciences, and the physical sciences may be well prepared for graduate study in this department. Students having deficiencies are given adequate opportunity to fulfill departmental requirements. Applicants should submit scores of the general aptitude and the advanced test in biology of the Graduate Record Examination.

Departments of Business

DEPARTMENT OF ACCOUNTING AND BUSINESS LAW

DEPARTMENT OF FINANCE
Professor and Department Head, H. Kerr; Professors, I. Field, R. Fuller, G. Petry, R. Rogovski; Associate Professor, C. Haas; Assistant Professors, G. Snieck, W. Wong.

DEPARTMENT OF MANAGEMENT AND SYSTEMS
Professor and Department Head, C. Morgan; Professor, V. Aggarwal; Associate Professors, D. Baker, M. Wang; Assistant Professors, H. Bahari, Kashi, M. Buckley, C. Chen, R. DeFilippis, R. Eier, D. Fodor, S. Fotopoulos, W. McKinley, D. Randall, R. Reed, L. Tsai.

DEPARTMENT OF MARKETING
Professor and Department Head, J. McCullough; Professors, R. Markin, D. Sien; Associate Professor, T. Anderson; Assistant Professors, J. Cote, E. Foxman, D. Muehling, P. Tansuhaj, U. Umesh, W. Weeks, J. Wong.

The study of business administration involves the understanding and application of knowledge developed in fields of accounting, information systems, finance systems, and banking, human resources/personnel, management, marketing, quantitative methods, and real estate. Concepts from mathematics, sociology, psychology, anthropology, economics, and other disciplines are integrated in order to provide the individual with both a practical and theoretical understanding of business organization and its functions in our society. The broad education offered by this curriculum permits the student an almost unlimited range of employment opportunities in business, industry, and government.

The curriculum leading to degrees in business administration at both the undergraduate and graduate levels are accredited by the American Assembly of Collegiate Schools of Business.
Accounting

Acc 231 Principles of Accounting I 3 Freshmen permitted if specializing in accounting. The structure and interpretation of accounts and financial statements.


233 Intermediate Accounting I 3 Prereq Accct 230. Theory underlying the determination of income; analysis of financial statements.


238 Cost Accounting 3 Prereq Accct 231; Math 201, 202; QMeth 215. Management uses of cost information; cost systems and system design; cost analysis.

430 Advanced Accounting 3 Prereq Accct 331. Partnership equities and extended forms of corporate ownerships and entities.

431 Accounting Theory 3 Prereq Accct 331. Accounting theory and contemporary issues.

433 Accounting Systems 3 Prereq Accct 232, 238; Cpt S 105; Mgt 350. Accounting systems design; internal control and computerization.

434 Accounting for Public Organizations 3 Prereq Accct 331. Conceptual and procedural accounting issues involving public sector organizations.

435 Advanced Tax Accounting 3 Prereq Accct 335. Corporate, partnership, estate, trust, and fiduciary taxation.

439 Auditing 3 Prereq Accct 331, 338, 433; Cpt S 105, Mgt 350. Nature of auditing, generally accepted auditing standards, and audit procedures as related to auditing of financial statements by independent accountants.

498 Internship in Business V 1-15 By interview only. Internship with a business organization in professional and managerial activities.

499 Special Problems V 1-4 May be repeated for credit.

530 Accounting Theory 3 Recent developments with respect to the determination of income and the valuation of assets.

532 Contemporary Accounting Cases and Problems 3 Accounting theory applied to external financial reporting practices.

533 Administrative Control 3 Managerial evaluation of budgeting, cost accounting, and financial analysis techniques; their utilization in control of operations.

534 Survey of Accounting 4 (3-3) Fundamentals of financial and managerial accounting: primarily for graduate students who wish to meet the MBA core requirements in accounting.

535 Taxation of Partners and Partnerships 3 Prereq Accct 335. Federal income tax impact on partners and partnerships of forming, operating, and liquidating partnerships.

536 Taxation of Corporations and Stockholders 3 Prereq Accct 333. Federal income tax impact on corporations and their stockholders from forming, operating, and liquidating corporations.

537 Estate Planning 3 Federal estate and gift taxation and income taxation of estates, trusts, and beneficiaries.

538 Seminar in Cost/Managerial Accounting 3 Cost concepts, cost and managerial accounting systems; current issues and research in cost and managerial accounting.

539 Seminar in Public Accounting and Auditing 3 Prereq Accct 439. Public accounting and auditing to present; emphasis on current issues including statistical sampling and computers.

596 Doctoral Seminar in Accounting 3 May be repeated for credit; cumulative maximum 9 hours. Advanced topics in accounting.

600 Special Projects or Independent Study Variable credit.

702 Master’s Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Business Law

B 210 Law and the Legal Environment of Business 3 Not open to freshmen. Fundamentals of business law; the legal system, legal reasoning and the law of contracts, torts, and agency.

410 Law and Government Regulation of Business 3 Prereq B 210. Legal aspects of government regulation of business; administrative law, antitrust law, and labor law.

411 Law of Business Organizations 3 Prereq B 210. Law of partnerships, corporations, securities regulation, secured transactions and bankruptcy; needed by CPA candidates.

414 Law of Real Estate 3 Prereq B 210. Legal principles and precedents as they apply to the real estate environment.

415 Law of International Trade 3 Prereq B 210. Legal organization of the international community; international aspects of trade and development, economic cooperation, and technical, social, and cultural cooperation.

499 Special Problems V 1-4 May be repeated for credit.

510 Law for the Business Manager 3 Contract, tort, constitutional and administrative law; impact of government regulation on business.

Finance

Fin 325 Finance 3 Prereq QMeth 215 or C/; Accct 231 or C/; Econ 201 or 203. Financial decision making, financial strategies, investment in current and fixed assets, financial instruments, and capital markets.

424 Commercial Bank Management 3 Prereq Fin 429. Problems facing bank managers and solution techniques; asset and liability management; loan pricing; banking structure; bank regulation.


426 Cases in Financial Management 3 Prereq Fin 325. Selected cases in finance; current and long-term financing; expansion; problems of small business.

427 Investments and Security Analysis 3 Prereq Fin 325. Investment objectives, security markets, market efficiency, and principles of security valuation.


429 Financial Institutions and Markets 3 Prereq Fin 325; Econ 320. Level and term structure of interest rates; characteristics of financial institutions and markets; financial futures.

498 Seminar 3 May be repeated for credit.

498 Internship in Business V 1-15 By interview only. Internship with a business organization in professional and managerial activities.

499 Special Problems V 1-4 May be repeated for credit.

502 Financial Management 3 Prereq Accct 534; Econ 201 or 203. Financial management of the firm; capital budgeting, working capital management, capital acquisition, and dividend policy.

521 Interest Rates and Financial Markets 3 Prereq Fin 325. Real and nominal interest rates; bond pricing; term and risk structure of interest rates; investment and commercial banking; financial futures.

524 Commercial Banking 3 Prereq Fin 502. Analysis of management and policy issues facing commercial banks, thrift institutions, and other financial service firms.


526 Problems in Financial Management 3 Prereq Fin 502. Application of financial principles to problems in financial management; credit policy, capital budgeting, leasing and mergers, cash management.

527 Investment Analysis 3 A decision-making approach to the problems of asset management for personal and business portfolios.


596 Doctoral Seminar in Finance 3 May be repeated for credit; cumulative maximum 9 hours. Prereq Fin 595. Advanced topics in finance.

600 Special Projects or Independent Study Variable credit.

702 Master’s Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.
Insurance
Ins 320 Risk and Insurance 3 Prereq: B Law 210; Econ 102 or 201. Types of risk and methods of protection; life, property, and liability insurance.
321 (421) Life and Health Insurance 3 Prereq Ins 320. Management of the life, health, and disability insurance risks facing the individual and society; private and public solutions.
498 Internship in Business V 1-15 By interview only. Internship with a business organization in professional and managerial activities.
520 Social Insurance 3 Economic security in our society; problems of death, old age, disability, accident, illnesses, and unemployment; private and public solutions.
600 Special Projects or Independent Study Variable credit.
702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

International Business
I Bus 380 International Business 3 International political economy; business relationships between nations; corporations and economic institutions.
481 International Finance 3 Prereq: Fin 325; I Bus 380. Financial problems of multinational businesses; international financial environment, long-term capital commitments to an international venture, financial techniques for international operation.
482 International Marketing 3 Prereq Mktg 360; I Bus 380. Opportunities, characteristics, trends in foreign markets; alternative methods; strategies; organizational planning, control; problems of adapting American marketing concepts and methods.
498 Internship in Business V 1-15 By interview only. Internship with a business organization in professional and managerial activities.
499 Special Problems V 1-4 May be repeated for credit.
580 International Business Management 3 Prereq Mgt 505; Fin 502. Decision-making in the international environment; political, cultural, and economic risk management.

Management
Mgt 301 Principles of Management and Organization 3 Principles of management and administration aimed at improving effectiveness of all types of organizations.
371 Applications Program Development 3 Prereq Mgt 350, Cpt S 241, or COBOL programming experience. Advanced program design principles; relative files, screen formatters, report writers, and designing to reduce future maintenance requirements.
372 Database Management Systems 3 Prereq Mgt 350. Database management systems and non-procedural languages; principles of file design and optimization.
401 Organizational Behavior 3 Prereq Mgt 301. Organizational behavior, motivation, leadership, communications, decision-making, group dynamics.
440 Advanced Operations Management 3 Prereq Mgt 340. Advanced concepts of production and operations management; development of analytical skills in identifying and solving production and operations management problems.
448 Introduction to Management Information Systems 3 Prereq Mgt 350. Information problems, management of the information resource, uses of computer-based systems to improve management decision-making.
451 Personnel and Human Resource Management 3 Prereq QMeth 215; Mgt 301. Policy and practice in human resource utilization, selection, training, motivating, evaluating, and compensating employees; labor relations; EEO legislation.
453 Comparative International Management 3 Comparison of management systems of selected countries.
455 Staffing 3 Prereq Mgt 450. The acquisition, selection, placement, and career management of employees; maximum human resource utilization.
456 Compensation Administration 3 Prereq Mgt 450; Econ 350. Theoretical, research, and applied issues related to the compensation of employees.
472 Systems Analysis and Design 3 Prereq Cpt S 370; COBOL. The application of systems analysis and design to the development of information systems; systems development life cycle.
483 Macro Organization Behavior 3 Prereq Mgt 301. Design and management of organization structures and processes and the effective linking of subsystems with their environment.
489 Entrepreneurial Management 3 Prereq Mgt 301; Mktg 360; Fin 325. Philosophy and nature of entrepreneurship for all business organizations; analytical, financial, and interpersonal entrepreneurial skills.
491 Business Strategy and Policy 3 Prereq completion of all other core courses. Overall management of the firm; top level decision-making and planning.
492 Small Business Policy 3 Prereq completion of all other core courses. Application of management theory and principles to small firms; applied consulting experience with operating businesses.
496 Seminar 3 May be repeated for credit.
498 Internship in Business V 1-15 By interview only. Internship with a business organization in professional and managerial activities.
499 Special Problems V 1-4 May be repeated for credit.
501 Management of Organizations 3 Leading, organizing, decision-making, planning, controlling, conflict management, and behavior in work organizations.
505 Operations Management 3 Prereq QMeth 215. For MBA and other graduate students with limited training in operations management. Managing the operations function; tools and techniques.
507 Computers and Systems for Managers 3 Data base concepts, management information systems, design of application programs, and computer concepts.
580 Information Systems Management 3 Prereq Mgt 301, 307. Data processing organization; operations, application development, computer selection, management of computer personnel and systems.
581 Operations Management 3 Prereq Math 202; QMeth 215; Mgt 340. Analytical approach to solving problems in production and operations management.
582 Personnel and Human Resource Management 3 Prereq Mgt 301. Human resources and personnel administration; selection, training, compensation, performance appraisal, labor relations, health and safety, EEO legislation.
583 Organization Design 3 Prereq Mgt 301. Development and design of contemporary systems of organization and management.
584 Organizational Behavior 3 Prereq Mgt 301. Theory and models of organizational behavior; individual, interpersonal, and group dynamics; influence, motivation, communications; change; organization climate.
591 Business Strategy and Policy 3 Overall management of the firm's top-level decision making and planning. To be taken during last two semesters of student's program.
596 Doctoral Seminar in Management 3 May be repeated for credit; cumulative maximum 9 hours. Advanced topics in management.
600 Special Projects or Independent Study Variable credit.
702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

Marketing
Mktg 360 Marketing Management 3 Prereq Mktg 360; 6 hrs Mktg. Analysis of marketing policy; approaches to solution of marketing problems.
367 Consumer Behavior 3 Prereq Mktg 360. The investigation of social-psychological phenomena affecting consumer decision processes; learning theory and communication.
368 Marketing Research 3 Prereq QMeth 215; Mktg 360. Survey and experimental methods as they relate to marketing research.
369 Marketing Management 3 Prereq Mktg 360; 6 hrs Mktg. Analysis of marketing policy; approaches to solution of marketing problems.
370 Product Policy and Pricing 3 Prereq QMeth 215; Mktg 360. Design development, introduction of new products, managing stable products, optimal pricing of products and product lines.
372 Marketing Models and Analysis 3 Prereq Cpt S 105; Math 201; QMeth 215; Mktg 360. The theory and evaluation of marketing models and their significance to the analysis of marketing problems.
363 Channel Structure and Systems 3 Prereq Mktg 360. Channel choice, cooperation and conflict; warehousing, inventory control and transportation in physical distribution; wholesaling industrial and consumer products.
368 Public Policy and Marketing 3 Prereq Mktg 360. Productivity and efficiency in marketing; government regulation of marketing structure and of marketing policies and practices; consumer protection and welfare.
470 Retail Management 3 Prereq Math 201; Mkgt 360. Retailing system; organization, merchandising models, pricing, promotion, location, and control procedures; management decision process.

477 Promotion Management 3 Prereq Mkgt 360. Text and case approach to integrating promotion into the marketing plan; methods, organization, communications, media selection, and campaigns.

478 Sales Management 3 Prereq QMeth 215; Mkgt 367. The role of selling in the marketing mix; problems in planning, organizing, evaluating and controlling the sales force.

498 Internship in Business V 1-15 By interview only. Internship with a business organization in professional and managerial activities.

499 Special Problems V 1-4 May be repeated for credit.

505 Survey of Marketing 3 Marketing management; relevance of marketing to company profitability and consumer satisfaction; decision regarding price, product, promotion, and distribution.

506 Marketing Management and Administrative Policy 3 Marketing management and administrative policies as they relate to concepts, strategies, and decision making.

565 Seminar in Marketing—Behavior/Economic Aspects 3 Marketing structure and behavior from economic and behavioral perspectives; social evaluation and behavioral implications of marketing strategy.

567 Consumer Behavior Theory 3 Prereq Mkgt 505. Theory in consumer and buyer behavior; conceptual and empirical research role of purchase and consumption behavior on society and marketing.

596 Doctoral Seminar in Marketing 3 May be repeated for credit; cumulative maximum 9 hours. Advanced topics in marketing.

600 Special Projects or Independent Study Variable credit.

702 Master’s Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Business Statistics and Data Processing

QMeth 215 Statistics 4 (2-3) Prereq Math 201. Data presentation, probability, distributions, hypothesis testing, estimation, time series, and simple linear regression as applied to business.

344 Principles of Optimization 3 Same as Math 364.

412 Statistical Methods for Management 3 Prereq QMeth 215; Math 202 or 171. Analysis of variance, regression models, and non-parametric statistics as applied to business.

416 Applied Business Forecasting 3 Prereq QMeth 215. 412. Using historical data to make forecasts; time series methodology; analysis of real data sets for the purpose of forecasting.

417 Introduction to Simulation 3 Prereq introductory statistics and FORTRAN programming. Model formulation, simulation, simulation languages, and analysis of results with selected application.

444 Decision Analysis 3 Prereq QMeth 215. Bayesian analysis, decision theory, utility, subjective probability and multiperson decision theory as applied to business.

498 Internship in Business V 1-15 By interview only. Internship with a business organization in professional and managerial activities.

499 Special Problems V 1-4 May be repeated for credit.

515 Quantitative Methods I 3 Prereq QMeth 215. Multiple regression models, analysis of variance, examination of residuals, transformation of data and model building procedures.

516 Time Series 3 Prereq QMeth 515 or Stat 443. ARIMA models; identification, estimation, diagnostics, and forecasting; seasonal adjustments, outlier detection, intervention analysis and transfer function modeling.

518 (514) Techniques of Sampling 3 Prereq QMeth 515. Sample surveys for business use; theory and application with emphasis on appropriate sample types and the estimation of their parameters.

519 Applied Multivariate Analysis 3 Prereq QMeth 515 or Stat 443. Principal components, factor analysis, discriminant function, cluster analysis, multivariate normal distribution, Hotelling's T^2 and MANOVA.

540 Quantitative Methods II 3 Prereq QMeth 215. Decision analysis, linear optimization models, nonlinear models, network analysis including PERT, and dynamics programming as applied to business.


586 Applied Multiple Time Series Analysis 3 Prereq QMeth 516, 519. Approaches to modeling and analysis of multiple time series.

596 Doctoral Seminar in Quantitative Methods 3 May be repeated for credit; cumulative maximum 9 hours.

600 Special Projects or Independent Study Variable credit.

702 Master’s Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Real Estate

R E

305 Real Estate 3 Prereq B Law 210; Econ 102 or 201. Relationships between location and value; patterns of urban land use; legal, financial, and organizational framework of the real estate business.

405 Valuation and Location Theory 3 Prereq QMeth 215; R E 305. Principles and practices of real property valuation; factors affecting real property values and income; appraisal and location theory.

406 Real Estate Administration 3 Prereq R E 305. The case method of analyzing management policies, practices, and decision making in real estate firms.

407 Real Estate Finance and Investment 3 Prereq Fin 325. Instruments, techniques, and institutions of real estate finance and investment; decision-making tools and applications.

498 Internship in Business V 1-15 By interview only. Internship with a business organization in professional and managerial activities.

499 Special Problems V 1-4 May be repeated for credit.

522 Advanced Topics in Real Estate 3 Basic forces that motivate and affect investors in their use and possession of real estate.

600 Special Projects or Independent Study Variable credit.

702 Master’s Special Problems, Directed Study, and/or Examination Variable credit.

Certification Requirements

To be eligible to certify as a business administration major, a student must have earned at least 40 semester hours of credit on graded course work, including 6 hours of business core courses, and meet current standards of (1) cumulative g.p.a., or (2) g.p.a. based on at least 15 hours of business core courses. Full details are available from the department; current standards are also published each fall in the Catalog Supplement.

General Program Requirements

General course requirements, core courses, and fields of specialization (options) are presented below. Requirements may vary depending upon the field of specialization selected. For more detailed information, students should contact the College of Business and Economics.

General courses include General University Requirements (GURs) and departmental requirements. Three-fifths (21 hours) of the GURs should be completed by the end of the sophomore year. In addition, all students must complete the core courses and a field specialization, selected during the junior year. The student's senior year (last 30 hours) must be taken in residence on the WSU campus.

Schedule of Studies

Freshman Year

First Semester

Hours

Engl 101 (GUR) 3
General elective* 3
Cpt S 105 4
Science (GUR) 3
Soc S (GUR) (Pol S or Hist) 3

Second Semester

Math 201 3
Lab Science (GUR) 4
Soc S (GUR) (Soc 101, Psych 105, or Anth 101) 3
Econ 102 3
Intercultural Studies (GUR)** 3

Sophomore Year

First Semester

Hours

Engl 201 (GUR) 3
Accctg 230 3
Math 202 (GUR) 3
B Law 210 3
General elective* 3

Second Semester

Accctg 231 3
General elective* 3
QMeth 215 3
Humanities (GUR) 3
Econ 203 3

Junior Year

First Semester

Hours

Fin 325 3
Mkgt 360 3
Mgt 350 1
Mgt 301 3
Econ 301 3
**Fields of Specialization**

**Accounting**
The objective of the baccalaureate program with a concentration in accounting is to provide basic conceptual accounting and business knowledge as a foundation for accounting career development. This would provide preparation for careers in public accounting, corporation accounting, and for accounting positions in government service. Junior and senior years: Acctg 232, 331, 335, 338, 410, 411, recommended for CPA. 433 and 439; two of (one of which must be accounting): Acctg 340, 431, 434, 435 or 438, Econ 320 or 340, Fin 425, 426, 427.

**Business Statistics and Data Processing**
Preparation for careers in business and government research.
Junior and senior years: QMeth 344, 412, 416, 417, 444; Three of: Cpt S 330, 370; Acctg 338, Econ 411, Fin 425 or Mgt 440 or Mktg 461; Stat 443, 444; Mgt 448, Mktg 462, Math 464; or course approved by Business Statistics area.

**Finance**
Preparation for careers in department of business, commerce and investment banks, governmental financial agencies, and other financial institutions.
Junior and senior years: Acctg 232, 331, Fin 425; one of Fin 426, 427, 429; Econ 320, and two electives from: R E 305, QMeth 412, Ins 321, 420; Fin 424, 427, 428, 429; two additional 300-400-level electives from accounting, economics, finance, or any combination.

**General Business**
Preparation for careers in business for the student who does not wish to specialize in any of the other options. Students looking forward to being proprietors of their own business frequently desire a general business course.
Junior and senior years: Acctg 338; two 400-level business electives; one 300- to 400-level business elective; one 300- to 400-level business or Econ elective; one of Fin 426, Mgt 440, 450, or Mktg 460.

**Human Resources/Personnel**
Preparation for careers in personnel and industrial relations and the personnel aspects of government service and business.
Junior and senior years: Mgt 401, 450, 455, 456; Econ 350; three of QMeth 412, Psych 412, Mgt 448, Econ 450, 451; 400-level business elective.

**Information Systems**
Preparation in computer programming and for careers in analysis and design of information systems in organizations where computers are an integral management tool.
Junior and senior years: Cpt S 370; Mgt 371, 372, 448, 472; two of QMeth 344, 417; two of Cpt S 250, 260, 350, Acctg 330, 338, 433, Mgt 401, 440, 450, Mktg 412, 416, 417 or 344 (opposite of choice above), 444.

**Insurance**
Preparation for careers in insurance agency, actuarial science, claims, corporate risk management, investment, and underwriting.
Junior and senior years: Ins 320, 321, 420, Mktg 478; one of Acctg 232, 335, 338; one of Mgt 401, 440, 448, 450; one of B Law 410, 411, 414.

**International Business**
Preparation for careers with multinational corporations, governmental and intergovernmental agencies at home and abroad.
Junior and senior years: I Bus 380, 481, 482, B Law 415, Mgt 453 and Econ 470. Additional coursework from a study abroad or residence curriculum must be fulfilled.

**Law and Public Policy**
Preparation for careers in consultates, embassies and the State Department, in criminal justice administration, court administration, public utility administration, labor union administration, and government agency administration; also private business dealing with the foregoing.
Junior and senior years: 15 hours of upperdivision courses from the College of Business and Economics, 18 upper-division hours from the College of Sciences and Arts. For specific course requirements contact the College of Business and Economics.

**Management**
Students may emphasize preparation for one of three careers in this option: (1) careers as production executives in manufacturing and enterprises and for other administrative positions in business and government for which production training is useful and desirable; (2) careers for which an understanding of international business is desirable; and (3) careers in management which require an understanding of people in organizations as well as the production function.
Junior and senior years: three of Mgt 401, 448, 450, 451, five of Acctg 338, QMeth 444, 412, 444, Econ 350, 450, W St 315, 400-level business elective and two 400-level management electives.

**Marketing**
Preparation for careers in marketing management, manufacturers' and wholesalers' sales, retailing, and marketing research.
Junior and senior years: Mktg 367, 368, 460, 461 or 462, 477; three of the following (one of which must be in Mktg or I Bus): Mktg 461, 462, 463, 468, 470, 478, I Bus 380, 482; and two elective courses as specified by the department.

**Real Estate**
Preparation for careers in real estate administration, appraisal, brokerage, finance, management, marketing, production, selling, and title insurance.
Junior and senior years: R E 305, 405, 406, 407, B Law 414, Mktg 478, and Econ 316; two of Ins 320, Acctg 335, Mktg 367, B Law 411, Fin 426, 428, Econ 312, 340, Arch 331, 342, Env S 444, Ag Ec 361, 440.

**Minor in Business Administration**
Students must complete the following to receive a minor in business: Econ 201 (or 102 and 203), Acctg 230, Mgt 301, Mktg 368; B Law 210 or QMeth 215; one of Fin 325, Econ 320, or Econ 340.

**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: B Law 210, QMeth 215, Acctg 230, 231, Fin 325, Mgt 301, 340, 350, 491 or 492, Mktg 360, and one additional 400-level course in business; Econ 102, 203, and 301; Cpt S 105; Math 201, 202; three Bus or Econ 300- or 400-level electives. If the lower-division courses required for this second degree can be taken as electives during the regular undergraduate degree program, the requirements for the second degree can be completed in one year. Otherwise, three semesters will be required for the second degree.

**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 which are numbered at the 300-level or above at WSU will not be accepted toward meeting major requirements.

**Preparation for Graduate Study**
The objective of the Master of Accounting program is to provide candidates with greater breadth and depth in accounting education than is possible in baccalaureate or masters in business administration programs in preparation for careers as professional accountants in financial institutions, government, industry, nonprofit organizations, and public practice.

**Programs of study leading to the Master of Business Administration degree** may be taken with coursework in several fields; accounting, finance, management, marketing, and quantitative methods.

The following courses should be completed prior to entering the graduate program: B Law 210, QMeth 215, Acctg 230, 231, Mgt 301, 340, Mktg 360; Econ 201 or 102, Econ 203, 301; Cpt S 105; Math 201, 202. They may be taken after entering the program but will be considered as deficiency courses, not part of the regular degree program.
Department of 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 of large-scale equipment for chemical manufacturing plants or they may engage in research leading to new or improved chemical processes, products, and uses. Graduates may also find rewarding work in plant operation, plant management, university teaching, sales-service, and other functions requiring chemical engineering training. The curriculum in chemical engineering in the College of Engineering is accredited by the Accreditation Board for Engineering and Technology (ABET).

The total number of majors in the department is restricted to junior level.

The department offers courses of study leading to the degrees of Bachelor of Science in Chemical Engineering, Master of Science in Chemical Engineering, and Doctor of Philosophy.

Description of Courses

For explanation see Index under “Symbols”

Ch E

101 Engineering Orientation I Engineering as a profession; career opportunities; general orientation for freshman engineers.

201 Chemical Process Principles and Calculations 4 Prereq Chem 106 or 116; Math 172. Fundamental concepts of chemical engineering; problem-solving techniques and applications in stoichiometry, material, and energy balances, and phase equilibria.

301 Chemical Engineering Thermodynamics 3 Prereq Ch E 201; Chem 331; major in Ch E. Definitions, basic concepts, and laws; property relationships; construction of thermodynamic charts and tables; compression and liquefaction of gases; power cycles; refrigeration.

330 Unit Operations I 4 Prereq Ch E 201; major in Ch E. Design calculations, operation, and evaluation of equipment used in fluid flow, heat transfer, and evaporation.

331 Unit Operations II 4 Prereq Ch E 330; major in Ch E. Design calculations, operation, and evaluation of equipment used in distillation, extraction, absorption, drying, humidification, filtration, and other unit operations.

405 Chemical Engineering Principles 3 Prereq Chem 106; Math 315. Basic chemical engineering principles for nonmajors. For engineering, chemistry, food science majors with an interest in chemical processing.

406 Industrial Chemical Processes 3 Prereq Chem 342 or c/c; Ch E 331. The chemistry, chemical engineering, and economics involved in modern chemical process industries.

412 Chemical Process Simulation I 2 Prereq Math 315; major in Ch E. Numerical methods for solving steady state chemical engineering problems.

413 Chemical Process Simulation II 1 Prereq Math 315, Ch E 330; major in Ch E. Numerical solutions to dynamic models of unit operations equipment.

414 Chemical Process Simulation III 1 Prereq Ch E 331, 421; major in Ch E; Ch E 451 or c/c. Simulation and computer-aided design of complex chemical process units.

421 Kinetics and Reactor Design 3 Prereq major in Ch E; Chem 331; Math 315. Chemical reaction kinetics applied to the design of reactors, non-ideal flow, mixing, catalysis.

433 Chemical Engineering Laboratory 2 (0-6) May be repeated for credit; cumulative maximum 4 hours. Prereq Ch E 331, 421 or c/c; major in Ch E. Laboratory experiments in heat and mass transfer; separations, other unit operations, kinetics, control; design calculations and report writing.

441 Process Control 3 Prereq Math 315; major in Ch E. Measuring instruments, automatic control, process and instrument characteristics and theory applied to industrial control problems.

451 Process Development, Design and Evaluation 3 Prereq Ch E 301, 331; major in Ch E. Development, design, and economic evaluation of chemical and related processes as practiced in industry.

461 Introduction to Nuclear Engineering 3 Prereq junior in Engr or Ph. S. Nuclear physics and radiation calculations; conceptual design of a nuclear reactor core and shielding using basic formulations of nuclear engineering.

475 Introduction to Biochemical Engineering 3 Prereq Ch E 331. Application of chemical engineering principles to the processing of biological and biochemical materials. (a/y)

480 Introduction to Extractive Metallurgy 3 Prereq Chem 331 or MSE 412. Processes for recovery of metals, physical and chemical principles of mineral processing, pyro-metalurgy, hydrometallurgy, and electro-metallurgy. (a/y)

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 adviser and industrial supervisor.

498 Technical Seminar 1 May be repeated for credit; cumulative maximum 2 hours. For juniors and seniors in Ch E.

499 Special Problems V 1-4 May be repeated for credit.

510 Transport Processes 3 Transport of mass, energy, and momentum; unsteady and steady states as applied to chemical processing; macroscopic and microscopic analyses. Joint listing with the University of Idaho (Ch E ID515).

519 Convective Heat Transfer V 1-3 Same as M E 515.

523 Basic Concepts in Catalysis 2 Preparation and characterization of supported heterogeneous catalysts, mechanistic interpretation of surface reactions and chemisorption, deactivation, and kinetics from lab experiments.

525 Polymer Reactor Engineering 3 Prereq Ch E 412. Reaction engineering applied to polymerization reactions; effects on polymerization rate, molecular weight, and copolymer composition.

527 Advanced Chemical Engineering Thermodynamics 3 Equilibria in physical and chemical systems; generalized prediction of thermodynamic properties, nonideal systems. Joint listing with the University of Idaho (Ch E ID527).

529 Chemical Engineering Kinetics 3 Interpretation of kinetic data and design of nonideal chemical reactors; fundamentals of heterogeneous catalysis, catalyst preparation, characterization, and theory. Joint listing with the University of Idaho (Ch E ID529).

532 Transport and Reactions in Multiphase Processing 3 Prereq Ch E 331. Momentum, heat, mass transfer, and reactions in multiphase processing as relevant to chemical, polymer, environmental, and biotechnology processes. (a/y)

541 Chemical Engineering Analysis I 3 Mathematical analysis of chemical engineering operations and processes; mathematical modeling and computer application. Joint listing with the University of Idaho (Ch E ID541).

542 Chemical Engineering Analysis II 3 Prereq Ch E 541. Numerical and analytical methods in the solution of chemical engineering problems; partial differential equations, statistical model building, integral transforms. Joint course taught at the University of Idaho (Ch E ID542).

546 Mass Transfer Operations II 3 Diffusional and equilibrium operations. Joint listing with the University of Idaho (Ch E ID546).

551 Discrete Digital Control 3 (2-3) Prereq Ch E 441. Design and implementation of digital control algorithms; Z-transforms; state space methods.

557 Advanced Plant Design V 2-3 Design of process plants for optimum cost and economic return; scale-up of pilot plants. Cooperative course taught at the University of Idaho (Ch E ID571).

560 Biochemical Engineering 3 Applications of chemical engineering to biological systems; fermentation processes, biochemical reactor design, transport phenomena in biological systems, biochemical technology. Joint listing with the University of Idaho (Ch E ID560).

580 Advanced Extractive Metallurgy: Fundamentals and Modeling 3 Prereq Chem 331, Math 315, Ch E 301, or MSE 412. Fundamentals of extractive metallurgical processes; mathematical modeling of processes and equipment. (a/y)

581 Advanced Topics in Chemical Engineering V 1-3 Filtration, reaction engineering, two-phase flow, non-Newtonian fluids, interfacial phenomena, fluidization, novel separations.

598 Research Seminar 1 May be repeated for credit. Seminar presentations on current topics in Chemical Engineering research.

600 Special Projects or Independent Study Credit.
Program in Chemical Physics

700 Master's Research, Thesis, and/or Examination Variable credit.
702 Master's Special Problems, Directed Study, and/or Examination Variable credit.
800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Schedule of Studies
The Bachelor of Science degree in Chemical Engineering requires a total of 128 semester hours. At least 61 of the total hours required for this degree must be in upper-division courses.

Freshman Year
First Semester
- Math 171 Calculus I 4
- Chem 105 Principles 4
- Eng 101 Composition 3
- Hum Elective 3
- Cpt S 204 Cpt Prog Eng 2

Second Semester
- Math 172 Calculus 4
- Math 220 Int Lin Alg 2
- Chem 106 Principles 3
- Chem 107 Qual Analysis 2
- Phys 201 Class Phy 4
- Soc S Elective 3

Sophomore Year
First Semester
- Chem 221 or 217 4
- Phys 202 Class Phys 4
- Math 273 Calculus III 2
- Math 315 Diff Eq 3
- Bio S Elective 3

Second Semester
- Ch E 201 Ch Proc Prin 4
- Ch E 213 Stat & Stgr Matl 3
- Eng 201 Exp Writing 3
- Hum Elective 3
- Math 440 Adv Engr Math 3

Junior Year
First Semester
- Ch E 330 Unit Oper I 4
- Chem 340 Organic 3
- Chem 341 C, Chem Lab 2
- Chem 331 Phys Chem 3
- Econ 201 Contem Econ 3

Second Semester
- Ch E 301 Ch E Thermo 3
- Ch E 331 Unit Oper II 4
- Chem 342 Organic 3
- E E 301 El Eng Fund 3
- E E 302 E E Fund Lab 1
- Chem 336 Class P Chem 2
- Ch E 412 Proc Sim I 3

Senior Year
First Semester
- Ch E 411 Proc Simuln 3
- Ch E 421 Kinetics 3
- Ch E 433 Ch E Lab 4
- Ch E 498 Tech Seminar 1
- Ch E Elective 3
- Technical Elective 3
- Ch E 413 Proc Sim I 3
- C E 463 Engr Admin 3

Second Semester
- Ch E 433 Ch E Lab 4
- Ch E 441 Proc Control 3
- Ch E 451 Design 4
- Ch E 498 Tech Seminar 1
- Ch E Elective 3
- Technical Elective 3

Ch E 414 Proc Sim IIP 1
Adv Hum or Soc S Elective 3

Well qualified students are encouraged to take Chem 115, 116, 117 in place of Chem 105, 106, 107.

Not required for students commencing freshman year in Fall 1984.

Required for students commencing freshman year in Fall 1984.

Ch E 433 must be taken for two semesters. It should be taken during the senior year.

Select from approved list of courses on file in departmental office.

A technical subject approved by the department chair before enrollment.

Must be an upper-division course continuing some prior field of study.

Pass-fail enrollment limited to these courses unless they are GURs.

Certification
Specific requirements for certification in Chemical Engineering can be obtained from the departmental office although eligibility usually occurs at the end of the sophomore year. Criteria for certification include overall g.p.a., grades earned in mathematics and physical science courses, and performance in the Ch E 201 course. A certified student earning a g.p.a. of less than 2.0 for two consecutive semesters is subject to decertification.

Transfer Students
Students who are planning to transfer to Chemical Engineering at Washington State University from other institutions should coordinate their programs with the department chair to establish a schedule of studies leading to the bachelor's degree. This is desirable because of sophomores professional requirements and course sequences. A strong preparation in chemistry, mathematics, 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. Since there is a restriction on the total number of majors in the department, transfer students should make application for admission as soon as possible.

Preparation for Graduate Study
As preparation for work toward an advanced degree, a student should have completed substantially the equivalent of the above schedule of studies. A Bachelor of Science degree in Chemical Engineering from an institution accredited by ABET normally will satisfy this requirement.

Special programs are also available for students with bachelor's degrees in chemistry or other areas of science who wish to obtain the Master of Science degree in Chemical Engineering.

Program in Chemical Physics
Professor and Program Head, R. D. Poshusta; Professors, P. F. Braunlich, G. A. Crosby, J. T. Dickson, H. W. Dodgen, K. W. Hippa, R. D. Willett, M. W. Windsor; Associate Professor, M. Miller; Assistant Professor, J. Walker.

Chemical physics is the interdisciplinary area which covers the extensive research and professional activity carried out in the overlapping regions of chemistry and physics. Included in chemical physics are topics such as theoretical and experimental studies of the electronic structure of atoms, ions, and molecules, their interactions with each other and with surfaces, study of the relationship of the equilibrium and dynamic properties of matter in bulk to the nature of its molecular constituents, and study of the absorption of energy and transfer between molecules. Use is made of quantum theory and statistical mechanics in the theoretical studies. Typical experimental techniques are those of electron and x-ray spectroscopy; spectroscopic methods covering most of the range of the electromagnetic spectrum; magnetic susceptibilities, and molecular, ionic, and electron beams. Computers are often used in both the theoretical and experimental investigations.

The research interests of the current members of the chemical physics program encompass a broad spectrum of theoretical and experimental methods. There are investigations involving NMR and NQR, fast reactions, laser Raman spectroscopy, surface physics and chemistry, interactions in crystals, photophysics and photochemistry of excited states using pulsed and continuous lasers, molecular quantum mechanics, computation of physical properties of small molecules, x-ray crystallography, magnetic and optical properties of solids, investigations of surfaces, and electron tunneling spectroscopy.

The interdisciplinary nature of the program is stressed and allows students maximum flexibility to meet their needs and interests; however, all students are expected to complete courses in thermodynamics, statistical mechanics, quantum theory, group theory, and atomic and molecular structure.

Undergraduate students may obtain a Bachelor of Science degree in Chemistry or Physics with a concentration in chemical physics. Upper-division students are given the opportunity to perform experiments with research apparatus through 499 projects. A student planning graduate study in chemical physics is advised to obtain a strong undergraduate preparation in physics, chemistry, and mathematics, although deficiencies in these areas may be remedied after graduate study has been undertaken. The course of study leads to the degree of Doctor of Philosophy.

Description of Courses
For explanation see Index under "Symbols"

Ch P
461 Atomic and Molecular Physics 3 Same as Phys 461. Credit not granted for both Ch P 461 and 561.

499 Special Problems V 1-4 May be repeated for credit.

538 Special Topics V 1-3 May be repeated for credit. Selected subjects in molecular structure, spectroscopy, solid state, and surface physics.

561 Atomic and Molecular Physics 3 Same as Phys 561. Graduate level counterpart of Ch P 461; additional requirements. Credit not granted for both Ch P 461 and 561.

562 Theoretical Methods in Chemical Physics 3 Operator techniques; molecular dynamics; many electron theory; molecular applications of quantum electrodynamics; magnetism; photophysics and photochemical processes; nonlinear optical phenomena.

564 Atomic and Molecular Phenomena 3 Prereq Ch P 461; Chem 509; Phys 450. Phenomena which yield information on structures, energy levels, and interactions of molecules in solid, liquid, and gaseous phases. (a,y)

590 Seminar 1 May be repeated for credit.
Chemistry is the fundamental science that deals with 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 or biochemistry prepares you for a variety of careers in industry, education, ecology, and public service, or for graduate study and research in chemistry and many related fields.

The department has excellent facilities and special equipment for graduate study and research. There are active research programs in analytical chemistry (neutron activation analysis, environmental trace analysis of solid surfaces, chemometrics, electroanalytical chemistry); biochemistry (enzyme kinetics; fluorescence, ORD/CD, isotopic tracer and substrate analog studies of enzyme mechanisms; NMR studies of ion binding to biological compounds; metabolic pathways in microorganisms; biochemical control mechanisms; protein biosynthesis and regulation of plant growth; biophysical chemistry of macromolecules); inorganic chemistry (kinetic and isotopic studies of reaction mechanisms; stereochemistry of coordination compounds; synthetic chemistry; organotransition metal compounds; NMR studies of stereochemistry and the nature of metal-ligand bonds); bioinorganic chemistry; organic chemistry (boron-carbon compounds; mechanisms of molecular rearrangements; secondary deuterium isotope effects; metal isocyanide complexes; reaction kinetics and stereochemistry; ring-chain tautomerism; synthetic medicinal chemistry; novel synthetic reactions; alkyl-transition metal intermediates), and physical chemistry (theories of valence and chemical bonding; molecular and crystal structure by infrared, Raman, x-ray, tunneling, and neutron spectroscopy; magnetic and nuclear quadrupole resonance; photochemistry of dyes and studies of photosynthesis using picosecond laser pulses; EPR; study of fast reactions by NMR, tracer, and angular correlation techniques; magnetic susceptibility studies; molecular quantum methods of inter- and intramolecular energy transfer; molecular electronic spectroscopy of solutions and solids).

The department offers courses of study leading to the degrees of Bachelor of Science in Biochemistry, Bachelor of Science in Chemistry, Master of Science in Chemistry, and Doctor of Philosophy (Biochemistry, Chemistry). The department of Chemistry offers a program leading to both a Bachelor of Science and Master of Science in Chemistry within a period of five years. Students wishing to enroll in the program must declare their intentions at the end of the junior year and begin research for the MS thesis while still an undergraduate.

The program is designed so that the BS degree will normally be awarded at the end of four years and the MS approximately 15 months later. In order to enter this program the student's undergraduate record must show that the final transcript is 2.0 of the requirements for admission to the WSU Graduate School. Further information on this program can be obtained from the Department of Chemistry.

A student beginning undergraduate work will begin the study of chemistry with Chem 104, 105 or 115, depending on preparation. (A new student must take the Placement Examination in chemistry prior to registration.) In order to take most courses in chemistry above the 100-level, the student must complete one of the following sequences: Chem 104, 105 and 106/107; 101, 105 and 106/107; 101, 102, and 106/107; 105 and 106/107; 115 and 116/117.

The Department of Chemistry provides major parts of the course work leading to degrees in the interdisciplinary Programs in Biochemistry/ Biophysics and in Chemical Physics. Students whose interests span chemistry and biology or chemistry and physics should see the section on the appropriate program in this bulletin.

Minor in Chemistry

Completion of a minor in chemistry requires at least 17 hours from 200-level and above chemistry courses. Three hours from Biochemistry/Biophysics 364, 366, 563, or 564 and up to 2 hours of Chem 499 may be used to satisfy this requirement.

CREDIT LIMITATIONS

Credit in only one of the chemistry courses in each of the following groups will be given:

(a) Chem 105, 115
(b) Chem 106/107, 116/117
(c) Chem 240, 340

LAB CHARGES

A charge for expendable laboratory supplies is made in each laboratory course.

Description of Courses

For explanation see Index under "Symbols"

General and Inorganic Chemistry

Chem

101 [P] Chemistry Related to Everyday Life I 4

(3-3) Prerequisite: Chem placement test score. Chemical phenomena important to humans and their environment; basic chemical concepts with applications to consumer products, technology, and life processes.

102 [P] Chemistry Related to Everyday Life II 4

(3-3) Prerequisite: Chem 101, 105, or 115. Acid-base concepts, pH and buffers, oxidation-reduction, organic functional groups and reactions; polymers, proteins, DNA, and genetic engineering.

104 Quantitative Preparation for Chemistry 2

Problem-solving techniques needed for Chem 105. For student showing weak arithmetical preparation on Chem Placement Test.

105 [P] Principles of Chemistry 4 (3-3) Prerequisite: Chem placement test, or Chem 101 or 104; Math 107 or c/. Stoichiometry, structure, gases, liquids, solids, solutions, thermodynamics, equilibrium, volumetric, and gravimetric analysis.

106 [P] Principles of Chemistry 3 Prerequisite: Chem 105 or 115. Acid, basic; ionic, molecular, solubility, and redox equilibria; bonding; electrochemistry; coordination compounds; systematic chemistry of the elements.

107 Qualitative Analysis 2 (2-6) Prerequisite: Chem 106 or c/. Qualitative analysis; identification of various cations and anions.

115 [P] Chemical Principles Honors 4 (3-3) Prerequisite: Math 107 or c/; superior physical science placement test score. Topics as for Chem 105, enriched by special lectures and demonstrations. For students with adequate background in science and mathematics.

116 [P] Chemical Principles Honors 3 Prerequisite: Chem 115 or superior grade in Chem 105; c/ in Chem 116. Basic laboratory experience in general chemistry with open-ended experiments.

191 Independent Study in Modern Chemistry V 3-5 May be repeated for credit; cumulative maximum 6 hours. Prerequisite: Chem 101, 105, 111, or c/. Independent study in the theory and practice of modern chemistry; written report required.

230 Computer Skills for Science Students 2 (1-3) Prerequisite: Math 151 or 153. Principles and practice of computer technology for controlling scientific experiments, collecting, analyzing, and graphing data; writing reports.

298 [P] Physical Science Honors 4 (3-3) Prerequisite: Math 198.

401 Modern Inorganic Chemistry 3 Prerequisite: Senior standing; Chem 055. Properties of substance; periodic systems; oxidation-reduction and acid-base characteristics interpreted on the basis of atomic and molecular structure.


503 Advanced Topics in Inorganic Chemistry V 1-3 May be repeated for credit. Prerequisite: Chem 502. Recent significant developments.

504 Organometallic Chemistry 3 Prerequisite: Chem 502. Chemistry of organometallic compounds and their applications in organic synthesis and catalysis. (a/b)

Analytical, Environmental, and Radiochemistry

Chem

220 Quantitative Analysis 2 Prerequisite: Chem 106, 107, or Chem 116, 117; c/ in Chem 222.

222 Quantitative Analysis Laboratory 2 (0-6) Prerequisite: Chem 107 or c/ in Chem 220.

421 Radiochemistry and Radiotracers 2 Prerequisite: Chem 220, 331; Phys 202. Credit not granted for both Chem 421 and 521.

*Open only to students in the Honors Program.
422 Radiochemistry Laboratory 1 (0-3) Prereq
Chem 222, 331; Phys 202. Credit not granted
for both Chem 422 and 522.
423 Nuclear Chemistry and Technology 3 Prereq
Chem 421/521. Credit not granted for both
Chem 423 and 523. (a/y)
424 Activation Analysis 2 (1-3) Prereq Chem 421
or 521. Credit not granted for both Chem 424
and 524. (a/y)
425 Quantitative Instrumental Analysis 2 Prereq
Chem 212, 217, or 221; Chem 332. Electronics
and instrumental analysis: gravimetric
analysis, titration, analysis of non-aqueous
systems; techniques of gas and liquid
chromatography; spectrophotometry and
electrochemical techniques. (a/y)
426 Quantitative Instrumental Analysis
Laboratory 2 (0-6) Laboratory experience in
modern analytical methods. (a/y)
427 Environmental Chemistry 2 Credit
not granted for both Chem 427 and 527. (a/y)
512 Microprocessors 1 Prereq Chem 425. (a/y)
513 Chemometrics 1 Prereq Chem 425. (a/y)
514 Mass Spectrometry 1 Prereq Chem 425. (a/y)
515 Trace Analysis 2 Prereq Chem 425. (a/y)
516 Local and Surface Microanalysis 2 Prereq
Chem 425. (a/y)
517 Chromatography 2 Prereq Chem 425. (a/y)
518 Electrochemistry 2 Prereq Chem 425. (a/y)
519 Analytical Spectroscopy 2 Prereq Chem 425.
(a/y)
520 Advanced Analytical Chemistry 2 Prereq
Chem 425. Chemical equilibria in aqueous
and non-aqueous systems; chelation titration;
oxidation-reduction; multistage separation,
statistical treatment of chemical data;
sampling. (a/y)
521 Radiochemistry and Radiotracers 2 Graduate
level counterpart of Chem 421; additional
requirements. Credit not granted for both Chem
421 and 521.
522 Radionuclide Chemistry Laboratory 1 (0-3)
Graduate level counterpart of Chem 422; additional
requirements. Credit not granted for both Chem
422 and 522.
523 Nuclear Chemistry and Technology 3 Graduate
level counterpart of Chem 423; additional
requirements. Credit not granted for both Chem
423 and 523.
524 Activation Analysis 2 (1-3) Graduate level
counterpart of Chem 424; additional
requirements. Credit not granted for both Chem 424
and 524.
527 Environmental Chemistry 2 Graduate
level counterpart of Chem 427; additional
requirements. Credit not granted for both Chem 427
and 527.
529 Selected Topics in Analytical Chemistry V 1-3
May be repeated for credit. Prereq Chem 401,
425. Selected current developments. (a/y)

Physical Chemistry
(See also Chemical Physics)

Chem
331 Physical Chemistry 3 Prereq Chem 220, 222;
Math 172; Phys 202; c/ in Chem 333. Concepts
of physical chemistry; basic thermodynamics;
free energy and entropy; phase equilibria; properties of solutions of
electrolytes and non-electrolytes.
332 Physical Chemistry 3 Prereq Chem 331; c/
in Chem 334. Elementary quantum theory;
molecular structure and spectra; bonding
theory; reaction rates; photochemistry and
radiation chemistry; energy states and
statistical thermodynamics.
333 Physical Chemistry Laboratory 1 (0-3) Prereq
Chem 331 or c/. Experiments selected to meet
the individual needs of students in
Chem, C E, MSE, BC/CP, or Bio S.
334 Physical Chemistry Laboratory 1 (0-3) Prereq
Chem 333. Continuation of Chem 333. Experiments
in molecular structure, atomic
molecular spectroscopy, chemical kinetics.
336 Classical Physical Chemistry 2 Prereq
Chem 331. Concepts and applications of classical
physical chemistry; transport and kinetic
properties; electrochemistry; colloids;
polymer and macromolecules.
409 Chemical Group Theory 3 Prereq Chem 332.
Mathematical definitions of groups and
representations, applications to chemical
structure and spectra, ligand field theory,
chemical reactions and selection rules. Credit
not granted for both Chem 409 and 509. (a/y)
430 Photochemistry and Optical Spectroscopy 2
Prereq Chem 332. Quantum description of
absorption and emission of light by molecules;
photophysical and photochemical behavior of
complex molecules; instrumental techniques.
435 Chemical Kinetics 1 Prereq Chem 333. Chemical
kinetics; application to inorganic,
organic, and biochemical systems. (a/y)
509 Chemical Group Theory 3 Graduate level
counterpart of Chem 409; additional
requirements. Credit not granted for both Chem
409 and 509.
531 Advanced Physical Chemistry I 3 Prereq
Chem 332. Chemical thermodynamics, phase
equilibria, chemical equilibria, critical
phenomena, solution thermodynamics,
nonideal mixtures, colloidal and surface
thermodynamics. (a/y)
532 Advanced Physical Chemistry 3 Prereq Chem
332. Methods of quantum chemistry, atomic
and molecular structure and spectra, chemical
bonding, statistical mechanics, and kinetic
theory, chemical kinetics.
533 Advanced Topics in Statistical Mechanics
and Thermodynamics 3 Prereq Chem 531, 534,
535. Non-equilibrium thermodynamics,
relaxation processes, statistical mechanics of
nonideal systems and materials in externalfa; approximation methods in statistical
mechanics.
534 Chemical Statistical Mechanics 3 Prereq
Chem 531, 532. Statistical theory of
thermodynamic variables and chemical
equilibrium; calculation of equilibrium properties
from spectroscopic data; fluctuations about
equilibrium; quantum statistics. (a/y)
535 Foundation of Quantum Chemistry 3 Prereq
Chem 332. Empirical, semi-empirical and ab
initio methods of quantum chemistry applied
to determination of chemical properties and
reactivity.
536 Advanced Quantum Theory 3 Prereq Phys 550.
Coupling angular momenta, relativistic
quantum theory of spin, atomic
molecular structure, second quantization,
density matrices, Green's functions and
propagator theory. (a/y)
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.

Organic Chemistry

Chem
240 Elementary Organic Chemistry 4 (3-3) Prereq
Chem 102, or 105 and 107, or 116 and 117.
340 Organic Chemistry 3 Prereq Chem 106 and
107, or 116 and 117; c/ in Chem 341.
341 Organic Chemistry Laboratory 2 (0-6) Prereq
Chem 106 and 107, or 116 and 117; c/ in
Chem 340.
342 Organic Chemistry 3 Prereq Chem 340; c/ in
343 Organic Chemistry Laboratory 2 (0-6) Prereq
Selected organic reactions including
mechanisms at an intermediate level.
540 Organic Reaction Mechanisms 3 Prereq
Chem 331, 342. The major classes of organic
reaction mechanisms and their significance;
kinetics and introductory theory.
541 Advanced Organic Chemistry 3 Prereq Chem
332, 342. Reactions of organic compounds;
fundamental theory and reaction
mechanisms.
542 Advanced Organic Chemistry 3 Prereq Chem
541. Synthesis of organic compounds; recent
developments from current literature.
543 Theoretical Organic Chemistry 3 Prereq
Chem 541. Relationship of reactivity to
molecular structure; mechanisms of organic
reactions.
544 Advanced Topics in Organic Chemistry V 1-3
May be repeated for credit. Prereq Chem 541.
Current research in organic chemistry.
546 Spectroscopic Identification of Organic
Compounds V 1-3 May be repeated for credit;
cumulative maximum 3 hours. Prereq Chem
342. Structural interpretation of H and 13C
NMR, vibrational and mass spectra of organic
compounds; audio-tutorial.

Problems, Seminar, Research, and Thesis

Chem
398 Undergraduate Seminar I For Chem or Biochem majors only.
499 Special Problems V 1-4 May be repeated for credit.
555 Approaches to Chemistry Teaching I May be repeated for credit. Workshop in teaching
methods in chemistry. Seminar 1 May be repeated for credit.
600 Special Projects or Independent Study
Variable credit.
700 Master's Research, Thesis, and/or Examination
Variable credit.
702 Master's Special Problems, Directed Study,
and/or Examination Variable credit.
800 Doctoral Research, Dissertation, and/or Examina-
Variable credit.

Biochemistry

For course descriptions and Schedule of Studies in Biochemistry, see Program in Biochemistry and Biophysics.

Schedule of Studies

At least 40 of the total hours required for the bachelor's degree in this program must be in upper-
division courses.

A student undertaking this curriculum after the beginning of the freshman year should consult with the
department undergraduate coordinator to
arrange a schedule which will permit completion of required courses in proper sequence.

**Freshman Year**

**First Semester**
- Chem 105 or 115 Principles
- Math 108 Precalculus
- Engl 101 Composition
- Bio S 102 or 103
- Elective

**Second Semester**
- Chem 106 or 116 Principles
- Chem 107 or 117 Qual Analysis
- Math 171 Calculus I
- Hum or Soc S Elective
- Elective

**Sophomore Year**

**First Semester**
- Chem 220 Quant Analysis
- Chem 222 Quant Anal Lab
- Phys 201 Class Phys
- Math 172 Calculus II
- Hum or Soc S Elective
- Elective

**Second Semester**
- Chem 340 Organic
- Chem 341 Organic Lab
- Phys 202 Class Phys
- Engl 201 Intro Comp
- Math 220 Linear Alg
- Elective

**Junior Year**

**First Semester**
- Chem 331 Physical
- Chem 333 Physical Lab
- Chem 342 Organic
- Chem 343 Organic Lab
- For L 101 First Semester
- Hum or Soc S Elective

**Second Semester**
- Chem 332 Physical
- Chem 334 Physical Lab
- Chem 398 Seminar
- For L 102 Second Semester
- Hum or Soc S Elective
- Elective

**Senior Year**

**First Semester**
- Chem 401 Inorganic
- Electives

**Second Semester**
- Chem 425 Adv Analytical
- Chem 426 Adv Analytical Lab
- Electives

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**Preparation for Graduate Study**

As preparation for work toward an advanced degree, it is expected that the student shall have completed courses totaling 40 semester hours of chemistry including inorganic, qualitative, quantitative, organic, and physical chemistry. The student shall also present 8 hours of physics, mathematics through calculus, and have a reading knowledge of scientific German, French, or Russian.

It is desirable that students interested in inorganic, analytical, organic, or physical chemistry present advanced courses in chemistry, hours of physics, computer science, or mathematics; advanced biological science courses are important preparation for students who propose to undertake graduate study in the field of biochemistry.

**Program in Chicano Studies**

Associate Professor, F. V. Padilla; Assistant Professor, M. J. Hernandez-G.

The curriculum of the Chicano Studies Program has been designed to present unique qualities of the Chicano cultural experience to all students of Washington State University. It brings to the student a meaningful and working knowledge through its courses in the social sciences, the humanities, and fine arts.

For majors and non-majors Chicano Studies courses provide a broad interdisciplinary program at the undergraduate level that equips graduates from many different specialized fields to play more effective educational roles in the Chicano community. Within this framework, students can augment their professional training and activities in business, education, social work, law, applied sciences, and community development.

In addition to the undergraduate degree requirements of the College of Sciences and Arts, the Chicano Studies major must complete 24 semester hours including 18 hours of upper-division work.

Students graduating with a Chicano Studies major must demonstrate a minimal level of proficiency in Spanish. Course work in Spanish is strongly urged.

A minor is offered in Chicano Studies and the program offers courses for the teaching major leading to the Bilingual Education (Spanish-English) Certificate Endorsement.

The course of study leads to the degree of Bachelor of Arts in Chicano Studies. Although some upper-division courses could apply as support work for graduate studies in some departments, this program does not offer an advanced degree.

**Description of Courses**

For explanation see Index under “Symbol”

Ch St

102 English Composition for Chicanos 3

110 [K] Introduction to Chicano Studies 3

248 Patterns of Chicano Family 3

272 Chicano Ethnohistory 1521-1910 3

313 Social Psychology and the Chicano Community 3

321 Chicano Art 3

324 Spanish for Spanish Speakers 1 3

329 In Contrastive Linguistics: Spanish-English 3

335 Bilingual Bicultural Education 3

340 Chicano Theater and Dance 3

375 Chicano/Latino Politics 3

411 Bilingual Methods and Materials Across Content Areas 3

413 Latin American Governments 3

493 Special Topics in Chicano Studies 3

500 Special Problems V 1.4

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Department of Child and Family Studies

Professor and Chair, R. M. Cate; Professors, M. O. Galloway, D. Z. Price; Associate Professors, R. S. Day, J. J. Dillman, K. L. Peterson, M. P. Ray, A. S. Richarz; Assistant Professor, J. C. Rogers.

This curriculum is designed for the student whose major concern is the development and welfare of the individual within a family setting and of the family as a unit. The program focuses on the normal physical, social, cognitive, and affective development and understanding of the individual, and on the functioning of the family in its various social, economic, legal, and political environments. The content of the program is derived from, and integrates relevant knowledge in, many basic fields such as anthropology, biology, economics, philosophy, psychology, and sociology.

The department offers two major options: Human Services and Child Development. Within the Human Services Option, a student may concentrate in one of three emphases: Family Studies, Consumer Studies, or Child Life. Within the Child Development Option, a student may concentrate in one of two emphases: Preschool Education or Child Development. The emphasis in Consumer Studies prepares a student for work with consumer-oriented private and government agencies. Employment possibilities also exist with...
Department of Child and Family Studies

agencies. Employment possibilities also exist with business firms as consumer representatives and consumer liaison people. With selected electives in communication and social psychology, graduates may later seek consumer-oriented positions in the media as well. The option also prepares one for credit and financial counseling services with various agencies.

The course of study in Family Studies combines with appropriate electives prepares students for a variety of positions with public and private social welfare and community agencies and junior research positions in the government. When combined with relevant electives, either the Consumer Studies or Family Studies option can prepare a student to work with health organizations, recreation centers, probation centers, gerontology groups, or with agencies concerned with the handicapped. Both options also provide preparation for graduate work leading to teaching, research, or administrative positions in welfare, government, or education.

The Child Life Emphasis prepares students to function in health care settings to promote optimum development of children, adolescents, and families, and to maintain normal living patterns and minimize psychological trauma. As integral members of the health care team in both the chronic ambulatory care and inpatient settings, child life staff provide opportunities for gaining a sense of mastery, for play, for learning, for self-expression, for family involvement and for peer interaction.

The Preschool Education Emphasis offers training for professional work in preschool education programs and education for a variety of social services concerned with children. These can include work with foster parent programs, adoption agencies, and various day care or home start programs.

The Child Development Emphasis provides basic preparation for graduate study and research in child development, leading to a variety of positions in higher education, government, and social agencies in teaching, research, or administration.

Minors are offered in consumer studies, family studies, and child development. For a description of the child studies major in elementary education, refer to the listing of the Department of Elementary and Secondary Education.

The department offers courses of study leading to the degrees of Bachelor of Arts in Child and Family Studies and Master of Arts in Child and Family Studies with a specialization in consumer studies, family studies (family relationships or family resource management), child development, preschool education or child life.

Description of Courses

For explanation see Index under "Symbols"

CFS

240 Human Development 1 Prereq Psych 101, 105, or Soc 101. Major theories of human development; important factors in development and guidance of children from birth into adolescence.

242 Directed Observation 1 (0-3) Prereq Psych 101, 102 or 105; Soc 101; c/c in CFS 240. Observation of children ages 0-18 years.

247 Communication in Family Journalism, a variety of CFS 101, 102, or 105. and 101. Basic dimensions and concepts of the family system; interaction between family members and with other external systems.

248 Patterns of Chicano Families 3 Prereq Psych 101 or 105; Soc 101 or Anth 101. Social, cultural, and economic factors affecting interaction of Chicano family members; influence on individual development and family functioning; compensatory programs.

320 Perspectives on Aging 3 Interdisciplinary examination of aging and the aging process; implications for the quality of life.

342 Curriculum for Young Children's Programs 3 CFS 240; c/c in CFS 343 for CFS majors. Curriculum theory, development, implementation and evaluation for early childhood programs for children ages 0-10 years.

343 Young Children's Program Lab 1 (0-3) Prereq c/c in CFS 342. For CFS majors.

344 Guidance of Young Children 3 (2-3) Prereq CFS 240. Application of theories of guidance to children ages 1-5 years; participation in preschool laboratories.

350 Decision Making in Families 3 CFS 247 or 9 hrs social sciences. Integrated nature of management in families; role of values in decision making.

352 Families as Consumers 3 Prereq Econ 102 or 201; CFS 350. Family's relation to consumer movement, consumer issues; interaction of consumers, government, and market; evaluation of consumer information and protection.

353 Family Housing Decisions 3 Prereq Soc 101; 101 or 102. Housing alternatives which meet human and family needs as affected by social, economic, political, and technical environment.

401 Practice in Preschool Education I 2 (0-6) Prereq CFS 342 or 344. Theory applied to teaching in the preschool.

402 Practice in Preschool Education II 2 (0-6) Same as CFS 401.

403 Professional Perspectives 3 Same as AgHE 403.

420 Adolescent and Early Adult Development 3 Prereq CFS 240. Theories and concepts of individual development in adolescence and early adulthood.

440 Theories of Human Development 3 Prereq CFS 240, 247. Theories of human development and application to programs for children and families. Credit not granted for both CFS 440 and 540.

442 The Child and Family in Poverty 3 Prereq Psych 102; Soc 101. Extent and distribution of poverty and deprivation; social psychology of poverty; effects on individual development and family functioning; compensatory programs.

446 Practice in Preschool Education II 2 (0-6) or 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. Prereq CFS 342, 344. Theory applied to teaching in the preschool.

447 Families in Crises 3 Prereq CFS 247, 450; S W 395. Crises in family life; range of intervention techniques for helping families.


450 Seminar in Child and Family Studies 1 Prereq 9 hrs CFS.

450 Management Experiences with Families 3 (1-6) Prereq CFS 350. Integration and application of management principles and processes concerning individuals, families, and community service agencies.

454 Topics in Family Financial Problems 1-3 May be repeated for credit; cumulative maximum 9 hours. Prereq Econ 102 or 303; Soc 101; CFS 350; or 9 hrs social sciences. Role of family in economy; effect of specified social, economic, legal, and political issues on family financial management. Credit not granted for both CFS 454 and 554.

495 Instructional Practicum V 1-4 May be repeated for credit; cumulative maximum 8 hours. By interview only.

497 Field Experience Preparation I 1-2 Prereq CFS 450. Preparation for field placement; career planning, resume preparation; placement opportunities, planning, and skills.

498 Field Experience II 1-8 Prereq CFS 400, 497. Supervised individual experiences with related businesses, organizations, or government agencies.

499 Special Problems V 1-4 May be repeated for credit.

505 Current Consumer Issues 2 May be repeated for credit. Prereq Econ, consumer or finance course; 3 hrs Psych or Soc. Major problems facing consumers; theoretical and practical implications for family consumption.

540 Theories of Human Development 3 Graduate level counterpart of CFS 440; additional requirements. Credit not granted for both CFS 440 and 540.

541 Perspectives in Child and Family Studies 2 Research methodologies, relevant professions and problem areas in child and family studies.

542 Research Methods in Child and Family Studies 3 Prereq 6 hrs child development. Methodologies in research on child and family issues; applications to current problems.

546 Organization and Administration of Human Service Programs 3 Legislation, management, programs, personnel, finances, resources, and relationships with other agencies.

548 Topics in Child and Family Studies 2 or 3 May be repeated for credit; cumulative maximum 9 hours. By interview only. Current topics in child and family studies.

549 Seminar in Child and Family Studies 3 May be repeated for credit; cumulative maximum 9 hours.

550 Family Decision Styles 3 Prereq 12 hrs social sciences. Effects of varying value patterns and decision styles on individuals within a family. (a/v)

552 Family Consumption Behavior 3 Prereq Econ 201 or 203; CFS 352, 452; or Econ 312. Consumer decisions as affected by psychological, sociological and economic factors. (a/v)

554 Topics in Family Financial Problems V 1-3 May be repeated for credit; cumulative maximum 9 hours. Graduate level counterpart of CFS 454; additional requirements. Credit not granted for both CFS 454 and 554.

555 Sex Roles in Society 3 Examination of changing roles of males and females in terms of sociological theories of social and institutional change.

557 Social Policy, Law, and the Family 3 Implications of social policy, law for family structure and function, individual development; effects of policy alternatives.

560 Social Policy and Development in Children 3 Prereq 12 hrs child development and/or Psych. Behavioral, cognitive approaches to selected topics, e.g., parent-child relations, modeling, aggression; implications for research and application to natural settings.
595 Instructional Practicum V 1-4 May be repeated for credit; cumulative maximum 8 hours by interview only. Prereq senior or graduate student. Supervised instructional practicum for departmental majors.

598 Professional Internship V 1-8 By interview only. Supervised individual practicum with business, organizations, and government agencies; opportunities for interaction with professionals in related only. Prereq senior or graduate student.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

Schedule of Studies

At least 45 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

Departmental Core: CFS 240, 242, 247, 320, 350, 442, 447, 450, 498; Engl 101; Econ 102; FSHSN 130; I D 202; Psych 105, 285 or Soc 320; Soc 101.

Child Development Option: Completion of departmental core and one emphasis below plus CFS 342, 343, 344, 440, 448; Sp Ed 301.

(1) Preschool Education emphasis: CFS 403, 446, 449 (2 hrs); Drama 364; Mus 388 or 390; Psych 361, 464 or 473; Sp Ed 371; Sp Ed 409; S W 390 or 395.

(2) Child Development emphasis: GenCB 201; CFS 403, 446, 449, 497; Psych 311, 361; Soc 350, 450; Sp Ed 409; Bio S 102; S W 395; Zoöl 251 or Psych 372.

Human Services Option: Completion of departmental core and one emphasis below plus CFS 352, 353, 454; Econ 203.

(1) Family Studies emphasis: CFS 342, 343, 401, 420, 440, 448, 457, 497; Pol S 101 or 206; S W 395 and 3 additional hrs S W.

(2) Consumer Studies emphasis: CFS 403, 454, 497; B Law 210; Econ 301, 312 or 320 or 340 or 350; Mkgt 300, 367; Pol S 101, 318 or 450.

(3) Child Development emphasis: Bio S 102; CFS 342, 343, 344, 403, 420, 446, 448, 449 (2 hrs); 497, 499 (2 hrs); Mus 388 or 390; Phil 260 or 365; RLS 460; Soc 446; SpCom 235; Sp Ed 371 or Drama 364; Sp Ed 301; Psych 321, 333 or 464.

Department of Civil and Environmental Engineering


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 objective of the degree program in civil engineering is to give thorough training in the fundamental principles that form the basis of the profession, care being taken to make the foundation broad enough to prepare the student to pursue a productive professional career. While this broad foundation is emphasized, opportunities are provided for some specialized study in the fields of environmental, geotechnical, hydraulic, structural, and transportation engineering.

The program leading to the Bachelor of Science degree in Civil Engineering is accredited by the Engineering Accreditation Commission (EAC) of the Accreditation Board for Engineering and Technology (ABET).

The curriculum includes the latest concepts in computer-aided design and computer applications in solving civil engineering problems.

The courses in surveying for civil engineers are taught during an intensive summer program on the WSU campus in Pullman. Attendance at this summer session is required unless equivalent course work has been completed in an accredited curriculum. The summer program should be taken as early as possible so the students may use their surveying skills to obtain better summer jobs. In addition, surveying skills are valuable in the intern program. Usually after the junior year, students wishing to go on internship with an agency or firm can arrange to work for seven months through the departmental intern program coordinator. Valuable practical experience and contacts developed during the internship are beneficial during the last year of undergraduate classroom and in shaping the student's professional career.

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 can be integrated with a graduate program to provide a continuous five-year 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 participates in interdepartmental programs leading to the degrees of Bachelor and Master of Science in Geological Engineering, Master of Science in Environmental Science, and Master of Regional Planning.

Description of Courses

Enrollment in the following courses will be restricted to department majors in engineering: C E 301, 302, 315, 317, 322, 330, 351, 403, 414, 416, 417, 421, 426, 430, 431, 433, 434, 435, 436, 437, 440, 441, 442, 460, 463, 464, 475, 480, 495.

For explanation see Index under "Symbols"

C E 101 Introduction to Surveying 3 (2-3) Prereq Math 107; Arch 101 or M E 101. Service course in elementary surveying for non-majors.

174 Introduction to Meteorology and the Atmospheric Environment 3 Introduction to meteorology, the atmospheric processes; weather, air pollution, and environmental topics.

211 Statics 3 Prereq Math 172 or c/c; Phys 201 or c/c. Engineering mechanics concepts; force systems; static equilibrium; centroids, centers of gravity; shear and moment diagrams; friction; moments of inertia.

212 Dynamics 3 Prereq C E 211. Kinematics and kinetics of particles and rigid bodies; introduction to mechanical vibration. Joint listing with the University of Idaho (ES ID230).

213 Statics and Mechanics of Materials 4 Prereq Math 172; Phys 201. Introduction to statics and mechanics of materials.

214 Introductory Dynamics 2 Prereq C E 211 or 213. Kinematics and kinetics of particles and rigid bodies.

299 Civil Engineering Systems 3 Prereq C E 211 or C E major. Civil engineering overview, systems approach, project scheduling, problem modeling, optimization, decision making.

301 Principles of Surveying 3 (1-6) Prereq Math 171; M E 101. Basic principles for using instruments and equipment in conducting engineering surveys (SS).

302 Engineering Surveys 3 (1-6) Prereq C E 301. Field work in application of principles presented in C E 301. (SS)

305 Photogrammetry and Photointerpretation 3 (2-3) Prereq C E 302. Geometry of single and stereoscopic pairs of aerial photographs; stereoplotters; photointerpretation; applications to engineering problems. Cooperative course taught at the University of Idaho (CE ID319).

314 Mechanics of Materials 3 Prereq C E 211. Concepts of stress, strain, and their relationships; axial loads, torsion and bending; combined stresses; properties of materials; columns, repeated loading. Joint listing with the University of Idaho (ES ID340).


317 Geotechnical Engineering I 3 (2-3) Prereq Geol 102; C E 314 or c/c. Structure, index properties, and classification of soils; compaction; effective stress; seepage; consolidation and shear strength.

322 Transportation Engineering 3 Prereq QMath 215; junior in C E. Transportation engineering; demand and performance functions; geometric design; capacity and control of transport modes.

320 Mechanics of Structures 4 Prereq Cpt S 203; Math 220; C E 314. Classical analysis of statically determinate and indeterminate structures; deflections; Influence lines and moving loads; introduction to matrix analysis.

341 Water Supply and Wastewater Engineering 3 Prereq Micro 101; Chem 105. Water supply development; wastewater collection systems, water transportation and distribution; engineering aspects of water quality.

342 Water and Wastewater Treatment 3 Prereq C E 341; certified engineering or environmental science majors only. Water and wastewater treatment processes and design.

351 Hydraulic Engineering 4 or 4 Prereq C E 315. Principles; hydrology, fluid mechanics, structures, and economic analysis applied to problems of hydraulic engineering.

403 Environmental Geology 3 Same as Geol 403.
405 Geophysical Engineering 4 (3-3) Theory and application of exploratory procedures in engineering and geological investigations; review of techniques. Credit not granted for both CEE 405 and 505.

409 Numerical Geology 3 Same as Geol 409.

414 Structural Design Laboratory 2 (0-0) Prereq CEE 431, 433. Senior design lab on the integration of course work into the execution of design.

415 Environmental Measurements 3 (1-6) Prereq Chem 105; certified engineering or environmental science majors only. Theory and laboratory measurement techniques used in analyzing environmental quality parameters. Credit not granted for both CEE 415 and 515.

416 Hydraulic Engineering Laboratory 2 (0-0) Prereq CEE 315. Experiments related to fluid flow principles and their application to hydraulic engineering.

417 Geotechnical Engineering II 3 Prereq CEE 317. Soil improvement and stabilization; advanced consolidation and shear strength theory; lateral earth pressure and slope stability.

421 Transportation Laboratory 2 (0-0) Prereq CEE 322. Field work to provide practical application experience in transportation problems.

426 Engineering Geology and Geotechnics 3 Prereq senior or graduate student in CEE or Geol. Procedures and techniques used to evaluate geologic data for site selection and design of engineering structures. Credit not granted for both CEE 426 and 526. Joint listing with the University of Idaho (CE ID435).

430 Quantitative Geomorphology 3 Same as Geol 430.

431 Structural Steel Design 3 Prereq CEE 330. Design of steel structures by working stress design and plastic design; uses of AISC Building Specification.

433 Reinforced Concrete Design 3 Prereq CEE 330. Loads: dead, live, wind, earthquake; design of reinforced concrete structures with emphasis on ultimate strength design; ACI Code.

434 Design of Concrete Structures 3 Prereq CEE 433. Composite construction; two-way slab systems; prestressed concrete; ACI code.

435 Foundations 3 Prereq CEE 317, 433. Analysis and design of foundations; footings, piles, retaining walls, sheet pilings; cofferdams; caissons, waterproof structures, piers and piling.

436 Design of Timber Structures 3 Prereq CEE 330 or CEE 330. Engineering properties of wood products; analysis and design; connection details; durability and moisture effects; lumber, plywood, glulam, poles, adhesives.

437 Statically Indeterminate Structures 3 Prereq CEE 330. Classical methods of frame analysis; moment distribution; slope-deflection; prismatic and non-prismatic members; matrix stiffness method, computer application.

440 Rock Mechanics 3 (2-3) Same as Geol 440.

450 Hydraulic Design 3 Hydraulic problems in planning and design of gravity and pressure systems; introduction to unsteady flow. Cooperative course taught at the University of Idaho (CE ID422).

451 Open Channel Flow 3 Prereq CEE 315. Steady, non-uniform flow; controls and transitions in fixed bed channels.

460 Intermediate Hydrology 3 Prereq CEE 351. Weather and precipitation; watershed characteristics; runoff; return frequencies; overland flow and hydrograph analyses; introduction to computer modeling; design applications.

462 Engineering Law and Contracts 2 Development of law, courts, and ethics; law on contracts, agency, sales, property, and patterns; specifications; preparation of contract documents. Cooperative course taught at the University of Idaho (CE ID 484).

463 Engineering Administration 3 Engineering economy; annual cost, present worth, rate of return, and benefit-cost ratio in engineering decision making; basic contract law.

464 Construction Management 3 Job scheduling, job planning, project control, records and policies, and construction equipment.

471 Meteorology 3 Prereq Phys 202; Math 273. Basic meteorology; atmospheric thermodynamics; cloud physics, synoptic meteorology; radiative processes; climate change. Credit not granted for both CEE 471 and 571.

474 Highway Design and Operation 3 Prereq CEE 322. Fundamental of geometric design and traffic engineering for urban and rural highways. Cooperative course taught at the University of Idaho (CE ID474).

475 Groundwater Hydrology 3 Same as Geol 475. (n/y)

480 Senior Seminar 1 Professional aspects of civil engineering.

491 Remote Sensing and Geologic Applications 3 (2-2) Same as Geol 491. Credit not granted for both CEE 481 and 581.

495 Engineering Interests 1-4 May be repeated for credit; cumulative maximum 4 hours. By interview only. Placement in a professional, governmental, or industrial situation for specialized or general experience.

499 Special Problems 1-4 May be repeated for credit.

501 Advanced Topics in Transportation Engineering 1-4 May be repeated for credit; cumulative maximum 9 hours. Prereq CEE 322; QMeth 215. Analysis, planning, design, and evaluation of transportation modes and systems.

502 Advanced Topics in Construction Engineering 1-4 May be repeated for credit; cumulative maximum 9 hours. Prereq CEE 464; Math 360. Analysis, planning, design, and evaluation of construction engineering and management.

505 Geophysical Engineering 4 (3-3) Graduate level counterpart of CEE 405; additional requirements. Credit not granted for both CEE 405 and 505.

506 Design and Construction of Water Wells 3 Analysis of geologic and engineering factors important in design, construction, and maintenance of water wells. Cooperative course taught at the University of Idaho (Hydro ID575).

507 Seepage and Earth Dams 3 Principles of earthdam design, failures, considerations in construction; principles governing flow of water through soils. Cooperative course taught at the University of Idaho (Geol E ID535).

508 Air Pollution Control Engineering 3 Prereq senior in Engr or Ph S. Measurement and control of air pollution; engineering design calculations; equipment and processes.

510 Advanced Topics in Geophysical Engineering 1-4 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 geotechnical engineering, advanced laboratory testing.

511 Seismic Hazard Assessment 3 Prereq CEE 417, 403. State-of-the-art methods in geotechnical engineering to assess earthquake and related ground failure hazards in the area.

512 Dynamics of Structures 3 Behavior of structures under impact, impulse, and seismic loads. Joint listing with the University of Idaho (CE ID543).

513 Stability of Structures 3 Elastic and inelastic buckling phenomena of bars, beams, frames, and plates.

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.

515 Environmental Measurements 3 (1-6) Graduate level counterpart of CEE 415; additional requirements. Credit not granted for both CEE 415 and 515.

516 Unsteady Cooled-Conduit Flow 3 Prereq CEE 351. Derivation of governing equations; finite difference methods; methods of characteristics; boundary conditions; computational procedures; transients caused by centrifugal pumps.

517 Unsteady Open-Channel Flow 3 Prereq CEE 451. Derivation of governing equations; explicit and implicit finite difference methods; computational procedures; stability and convergence.

518 Advanced Hydrology 3 Prereq CEE 460. Principles of the hydrologic cycle in mountainous areas; precipitation, snowmelt, and systems simulation. Cooperative course taught at the University of Idaho (Ag E ID551).

519 Special Topics in Air Pollution V 1-3 May be repeated for credit; cumulative maximum 6 hours. Advanced topics in the area of industrial and urban air pollution control problems and air pollution control engineering.

526 Engineering Geology and Geotechnics 3 Graduate level counterpart of CEE 426; additional requirements. Credit not granted for both CEE 426 and 526.

527 Advanced Soil Mechanics 3 Prereq CEE 317, 318. Effective stresses and lateral earth pressures; interrelationships of applied stresses, permeability, strain and shear strength of soils. Cooperative course taught at the University of Idaho (CE ID561).

528 Advanced Foundation Engineering 3 Prereq CEE 317. Consolidation theories, bearing capacity, and settlements of foundations, pile group behavior, theory of subgrade reaction, materials foundations, laterally loaded piles. Cooperative course taught at the University of Idaho (CE ID562).

530 Computer Methods of Structural Analysis 3 Classical methods of frame analysis; matrix stiffness method applied to trusses and frames; plastic analysis of frames; non-linear and stability analysis of frames.

531 Advanced Structural Design 3 Advanced concepts in structural design; computer-aided design. Joint listing with the University of Idaho (CE ID541).

535 Finite Elements 3 Theory of finite elements; applications to general engineering systems considered as assemblies of discrete elements.

534 Advanced Topics in Structural Engineering 3 May be repeated for credit; cumulative maximum 6 hours. Prereq CEE 433. Material properties; design criteria; structural reliability; computer-aided design.

577 Theory of Plates and Shells 3 Mathematical theories of plate and shell solutions; plates of
various shapes; large deflections; buckling of plates; membrane theory of shells. (a/y)

540 Instrumental Analysis of Environmental Contaminants 3 (1-0) Prereq C E 415. Theory and methods of analysis of water and wastewater samples for contaminants using spectrophotometry, fluorometry, and chromatographic techniques. (a/y)

541 Environmental Engineering Unit Operations 3 Prereq Math 315; C E 342. Theory and design of physical and chemical unit operations of water and wastewater treatment systems. Joint listing with the University of Idaho (CE ID531).

542 Environmental Engineering Unit Processes 3 Prereq C E 541. Biochemical energetics and kinetics of biological waste treatment processes; nutrient removal; advanced wastewater treatment design. Joint listing with the University of Idaho (CE ID532).

543 Advanced Topics in Environmental Engineering Practice V 2-4 May be repeated for credit; cumulative maximum 8 hours. Analysis and evaluation of water and wastewater systems; problems associated with solid waste, radiological health, environmental health or air pollution.

544 Wastewater Treatment System Design 3 (2-3) Prereq C E 542 or c/. Evaluation of unit operations and processes to design of integrated treatment systems; critical review of designs. Joint listing with the University of Idaho (CE ID536).

545 Industrial Waste Problems 3 Prereq C E 542 or c/. Evaluation of feasible solutions of industrial waste problems. (a/y)

546 Radiological Health 3 (2-3) Sources and units of radiation and radioactivity, radiological health, radiation detection, and radiotoxic waste disposal. (a/y)

548 Advanced Topics in Water Quality Engineering Systems V 2-4 May be repeated for credit; cumulative maximum 6 hours. Analysis and evaluation of natural water systems for retention and transport of pollutants and their associated impacts.

549 Solid Waste Management and Design 3 (2-3) Prereq C E 342. Solid waste management with emphasis on design of processing and disposal facilities. (a/y)

550 Intermediate Fluid Mechanics 3 Prereq C E 315. Basic flow equations; Navier-Stokes equations; similarity; boundary layer flow; turbulence and diffusion; uniform and non-uniform conduct flow; drag and lift.

552 Advanced Topics in Hydraulic Engineering V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq C E 315. Cavitation, air entrainment, hydraulic machinery, similarity, mixing in rivers and estuaries, hydraulic design.

553 River Engineering 3 Prereq C E 351, 451. Fluid mechanics, morphology, hydrology, and hydraulic engineering as they affect natural and man-made influences on rivers. (a/y)

554 Advanced Hydraulic Design 3 (2-3) Prereq C E 315. Dams, spillways, and outlet works; design of a major structure. Cooperative course taught at the University of Idaho (CE ID522).

555 Natural Channel Flow 3 Hydraulics of non-uniform flow in irregular channels; unsteady flow; routing and density currents. Cooperative course taught at the University of Idaho (Age ID555).

556 Numerical Modeling in Fluid Mechanics 3 Prereq M E 313. Fundamental concepts in development of numerical models for fluid flow with applications to steady and unsteady flows. (a/y)

557 Topics in Fisheries Engineering V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq C E 315. Application for fluid mechanics and hydraulics to current fisheries engineering problems; habitat improvements, fishways, culvert passage, instream flow needs. (a/y)


559 Stochastic Hydrology 3 Prereq C E 351. Applications of probability in hydrology; analyses and evaluation of hydrologic data; regression analyses and simulation techniques. (a/y) Joint listing with the University of Idaho (CE ID528).

560 Advanced Topics in Hydrology V 1-3 Prereq C E 460. Separate compounds in the hydrologic cycle; computer-based simulations and data analyses of isolated or combined events.

561 Water Resources Systems 3 Concepts in water development; coordination of development of other natural resources; systems approach and optimization techniques. Cooperative course taught at the University of Idaho (CE ID523).

562 Water Resources Planning 3 Prereq C E 351. Design and feasibility studies in water supply, power, flood problems, navigation, irrigation, recreation. Cooperative course taught at the University of Idaho (CE ID524).

563 Hydropower Planning V 1-3 Prereq C E 351. Feasibility studies of potential hydropower siting; hydrology, site economics, licensing requirements, operations and environmental assessments.

564 Hydropower Design V 1-3 Prereq C E 351. Hydraulic design of hydropower facilities; earth and concrete dams; spillways and energy dissipators; intakes, water conveyance facilities, turbines and related equipment.

571 Meteorology 3 Graduate level counterpart of C E 471; additional requirements. Credit not granted for both C E 471 and 571.

572 Air Pollution Abatement and Administration 2 Air quality management, criteria, and standards; administration of air pollution control agencies; enforcement, inspection and surveillance.

574 Air Pollution Seminar 1 May be repeated for credit; cumulative maximum 2 hours. Recent advances in air pollution research.

575 Atmospheric Dynamics 3 Prereq Phys 202; Math 315. General circulation theory, dynamic meteorology, climate dynamics, numerical prediction methods, geophysical fluid mechanics.

577 Advanced Groundwater Hydrology 3 Same as Geol 577.

578 Groundwater Management 3 Prereq Geol/C E 475. Hydrologic, economic, and legal factors controlling development and management of groundwaters.

Cooperative course taught at the University of Idaho (Hydro ID572).

579 Hydrochemistry 3 Same as Geol 579.

580 Graduate Seminar 1 May be repeated for credit; cumulative maximum 2 hours. Lectures and reports on current developments in research and practice.

581 Sanitary Engineering Analysis 2 (1-3) Prereq C E 541. Theoretical and laboratory methods for development of design criteria for sanitary engineering systems.

582 Microcomputer Aided Design in Environmental Engineering 2 (1-3) Prereq basic programming. Programming: interaction with the microcomputer in the analysis and design of unit processes and systems.

583 Engineering Aspects of Aquatic Chemistry V 2-4 Prereq C E 342. Chemical principles as applied to water supply and pollution control engineering.

584 Engineering Aspects of Aquatic Biology 4 (3-3) Prereq C E 583. The role of microorganisms; bacteria, algae, fungi, viruses and protozoa in water and wastewater systems.

586 Applied Stream Sanitation 3 (2-3) Prereq C E 341, 415/515. Assimilating capability and complex self-purification capacity of a natural water system. (a/y)

588 Atmospheric Turbulence and Air Pollution Modeling 3 Prereq C E 571. Physical aspects of atmospheric turbulence, theoretical developments in atmospheric diffusion, and applied computer modeling with regulatory and research models.

589 Atmospheric Chemical and Physical Processes 3 Processes of removal of pollutants from the atmosphere; radical chain reactions, particle formation, model calculations.

591 Remote Sensing and Geologic Applications 3 (2-3) Graduate level counterpart of C E 491; additional requirements. Credit not granted for both C E 491 and 591. Same as Geol 591.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Schedule of Studies

A Bachelor of Science degree in Civil Engineering ordinarily requires a total of 134 hours. At least 50 of the total hours required for this degree must be in upper-division courses. None of the courses listed below may be taken on a pass/fail basis.

Freshman Year

First Semester

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Math 171</td>
<td>Calculus I</td>
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<tr>
<td>Chem 105</td>
<td>Principles</td>
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<tr>
<td>Engl 101</td>
<td>Composition</td>
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<tr>
<td>M E 101</td>
<td>Graphic Design</td>
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<td>Hum Elective</td>
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Second Semester

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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tr>
<td>Math 172</td>
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</tr>
<tr>
<td>Phys 201</td>
<td>Engineering</td>
<td>4</td>
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<tr>
<td>Econ 201</td>
<td>Fundamentals</td>
<td>4</td>
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<tr>
<td>M E 102</td>
<td>Descriptive Geom</td>
<td>2</td>
</tr>
<tr>
<td>Geol 102</td>
<td>Physical Geology</td>
<td>4</td>
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</tbody>
</table>
Sophomore Year

First Semester
- Math 220 Linear Alg: 2
- Math 273 Calculus III: 2
- Phys 202 Engineering: 4
- C E 211 Statics: 3
- Cpt S 201 Comp Prog Engrs: 2
- Micro 101 Bac & Pub Health: 4

Second Semester
- Math 315 Diff Eq: 3
- M E 320 Materials Lab: 1
- C E 212 Dynamics: 3
- C E 314 Mech of Materials: 3
- C E 299 C E Systems: 3
- Soc S Elective: 3

Summer Engineering Program
- C E 301 Prin of Surveying: 3
- C E 302 Engineering Surveys: 3

Junior Year

First Semester
- C E 315 Mech of Fluids: 3
- C E 317 Geo Tech: 3
- Stat 360 Statistics: 3
- C E 330 Mech of Structures: 4
- C E 341 Water Supply: 3

Second Semester
- C E 322 Transportation Engr: 3
- C E 342 Water & Wastewtr Tr: 3
- C E 351 Hydraulic Engr: 3
- C E 433 Reinforced Concrete Des: 3
- Hum Elective: 3

Senior Year

First Semester
- C E 431 Structural Steel Design: 3
- C E 463 Administration: 3
- Dept Elective: 3
- M E 301 Thermodynamics: 3
- Com Prof Elective: 3

Second Semester
- Dept Elective: 5
- C E 480 Senior Seminar: 1
- Engl 402 Prof Writing: 3
- Intercultural Elective: 3
- E E 301 Fundamentals: 3

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 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 above for certification. Applications from transfer students will be handled by the Admissions Office and the students do not need to make separate application to the department.

Preparation for Graduate Study

As preparation for academic work toward an advanced degree in civil engineering, geological engineering, or environmental engineering, a student should have completed substantially the equivalent of the above schedule of studies.

Department of Clothing, Interior Design and Textiles

Chair, J. Thompson; Associate Professors, D. Harrison, J. M. Krouly; Assistant Professors, C. Bicknell, C. Cox, J. Miller, P. Ortiz, P. Pritchett, J. Rogers; Teaching Associate, D. Handy.

The Department of Clothing, Interior Design, and Textiles offers undergraduate and graduate programs in clothing and textiles and interior design leading to degrees of Bachelor of Arts in Clothing and Textiles, Bachelor of Arts in Interior Design, and Master of Arts in Home Economics.

CLOTHING AND TEXTILES

A major in clothing and textiles offers fashion merchandising with a concentration in either business or design. This major combines clothing and textiles courses with business and economics, fine arts and the social sciences. Students in fashion merchandising prepare for management positions in retailing and apparel production firms. It is also possible for students to use the electives in either concentration to prepare for careers in fashion communication or for graduate study of social-psychological or historical-cultural aspects of clothing or in textile research.

For explanation see Index under "Symbols"

Clothing and Textiles

C T

108 Merchandising Options 2 Structure and operation of the textile/apparel production retail complex; career opportunities in the production fashion business.


216 Clothing Construction Concepts 3 (2-3) Prereq C T 215; 1 D 101 or c/. Garment construction, fitting, and evaluation.

217 Clothing and Human Behavior 3 Prereq Soc 101; Psych 105. Interdisciplinary approach to microcomputer, sociological, physical, and economic aspects.

218 Apparel Analysis 3 (2-3) Prereq I D 101; C T 215 or c/. Commercial apparel production; sizing, styling, and fit of commercially produced garments; fashion terminology.

311 Flat Pattern 3 (1-6) Prereq C T 216. Development of clothing design from a basic pattern.

313 Weaving 3 (1-6) Principles, techniques, and aesthetics of weaving. Cooperative course at the University of Idaho (HC 402).

314 Tailoring 3 (1-6) Prereq C T 216. Custom tailoring techniques, both traditional and contemporary.

315 Textile Products 3 Prereq C T 215; Chem 101. Application of basic textile concepts to selection and use of textiles; new developments, fundamental concepts for textiles care.

318 Merchandising I 3 (2-3) Prereq Mkgt 360 or c/. Application of planning and buying principles to merchandising including use of microcomputer for word processing and spreadsheets.

403 Professional Perspectives 3 Same as AgHE 403.

410 History of Costume and Fabrics 3 Prereq 3 hrs F A history. Socio-cultural aspects of clothing, 1800 to present. (a/y)

411 Clothes and Culture 3 Prereq 3 hrs F A history. Socio-cultural aspects of clothing; western costume from pre-historic to 1799. (a/y)

412 Original Apparel Design 3 (1-6) Prereq C T 311. Design and construction of apparel.

413 Clothing Consumption 3 Prereq Econ 201 or 203; Mkgt 360. Economic and social conditions which influence clothing consumption.

414 Advanced Weaving 3 (1-6) Drafting and designing woven structures. Cooperative course taught at the University of Idaho (HC 414).


416 Designing for the Loom 3 (1-6) Prereq C T 414. Design possibilities unique to woven textiles. Cooperative course taught at the University of Idaho (HC 416).

417 Social Psychological Aspects of Clothing 3 Prereq 12 hrs social science. Research and theory applied to clothing and human behavior. Credit not granted for both C T 417 and 517.
### Department of Clothing, Interior Design and Textiles

#### FASHION MERCHANDISING OPTION – Business Concentration

At least 40 of the total hours required for the bachelor's degree in this program must be in upper-division courses. Courses required for the completion of an option cannot be taken on a pass/fail basis.

The Business Concentration prepares students for management positions in retailing and apparel production firms. Students who complete the C T major receive a Bachelor of Arts degree in Clothing and Textiles.

#### Freshman Year

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<thead>
<tr>
<th>First Semester</th>
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<tr>
<td>C T 108 Merchandising Options</td>
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<td>Engl 101 Composition (GUR)</td>
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<td>Soc 101 or Anth 101 (GUR)</td>
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<tr>
<td>Math 101* or Elective</td>
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<tr>
<td>FSHN 130 Nutrition for Man (GUR)</td>
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### Sophomore Year

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<tr>
<td>C T 215 Textile Fundamentals</td>
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<td>Acctg 230 Principles of Acctg</td>
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<tr>
<td>C T 315 Textile Products</td>
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<td>C T 318 Merchandising I</td>
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<tr>
<td>Mkgt 367 Consumer Behavior</td>
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<tr>
<td>C T 413 Clothing Consumption</td>
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<td>C T 418 Merchandising II</td>
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<tr>
<th>Second Semester</th>
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<tbody>
<tr>
<td>Mkgt 470 Retail Management</td>
<td>3</td>
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<tr>
<td>C T 403 Prof Perspectives</td>
<td>3</td>
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<td>CIDT Elective</td>
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### Senior Year

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<tr>
<td>C T 418 Merchandising II</td>
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<tr>
<th>Second Semester</th>
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<tbody>
<tr>
<td>C T 412 Original Apparel Design</td>
<td>3</td>
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<tr>
<td>C T 403 Prof Perspectives</td>
<td>3</td>
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<td>CIDT Elective</td>
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Supportive Electives: Mkgt 477; Adver 280, 280; Engl 201, 301, 401; Cpt S 105; Econ 320, 340. A maximum of 4 undergraded credits may be used to satisfy CIDT Electives.

A maximum of 4 credit hours of C T 499, Special Problems may be applied toward the Clothing and Textiles degree.

*Score of 25 or better on Washington Pre-College Mathematics Examination.

**Required of all entering and subsequent students as of fall, 1985. Students must earn a C or better to transfer credit for a required course.

### FASHION MERCHANDISING OPTION – Design Concentration

At least 40 of the total hours required for the bachelor's degree in this program must be in upper-division courses. Courses required for the completion of an option cannot be taken on a pass/fail basis.

The Design Concentration prepares students for design positions in retailing and apparel production firms.

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<td>Psych 105 (GUR)</td>
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<td>Chem 101 (GUR)</td>
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<td>Speech Elective (GUR)</td>
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<td>Humanities or Arts Elective</td>
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*Score of 25 or better on Washington Pre-College Mathematics Examination.

**Required of all entering and subsequent students as of fall, 1985. Students must earn a C or better to transfer credit for a required course.

A maximum of 4 credit hours of C T 499, Special Problems may be applied toward the Interior Design degree.
Minor in Clothing and Textiles
For a minor in clothing and textiles, the student must complete 18 credits in the department including 1 D 101, C T 215, C T 217 and C T 318 or C T 418. Students interested in a C T minor should contact the department office in White Hall, Room 202, to be assigned a minor adviser who will help them choose additional C T courses.

INTERIOR DESIGN
The Interior Design major prepares students to enter the profession with interior design or architectural firms or in allied fields. The course of study is accredited by the Foundation for Interior Design Education Research (FIDER) and provides a balanced program in the humanities as well as in interior design and architecture.

Students wishing to certify into the interior design curriculum must:
1. Complete a minimum of 45 semester hours, including four courses from 1 D 101, 201, 203, Arch 101, 102, or equivalents.
2. Submit a statement of professional goals.
3. Submit a portfolio of class work from the courses listed above.
Certification will be granted to only the most qualified students based on minimum requirements, and demonstrated abilities. Students wishing to major in interior design should contact the department for additional information.

Description of Courses
For explanation see Index under "Symbols"

Interior Design
1 D
101 Basic Environmental Design I 3 (2-2) Sensory awareness as a design determinant; introduction to basic design elements in problem identification and solving processes.

102 Basic Environmental Design II 3 (2-2) Prereq 1 D 101. Application of basic design elements to the exploration of space and form.

201 Perception and Communication I 3 (0-6) Prereq 1 D 101, 102, or c/c. Theoretical concepts relating to design objects and elements explored through various design and communication media.

202 [H] The Built Environment 3 Same as Arch 202.

203 Perception and Communication II 3 (1-4) Prereq 1 D 201. Developing perceptual awareness and use of media to convey sensory data and meaning.

211 History of Design I 2 Design forms from prehistoric periods to the Renaissance period.

212 History of Design II 2 Prereq 1 D 211. Interiors and furnishings from the Renaissance period to the Industrial Revolution.

311 History of Design III 2 Interiors and furnishings from the Industrial Revolution through the 20th Century.

321 Fundamental Residential Planning 4 (1-9) Prereq 1 D 203. Design investigations of personal space of specified size and complexity for people of varying social, economic, and cultural backgrounds.

325 Lighting for Interiors 3 (2-3) Analysis, planning, production, and visual applications of interior lighting; artificial lighting sources.

333 Fundamental Commercial Planning 4 (1-9) Prereq 1 D 203. Design of commercial environmental situations for the needs of corporate clients.

391 Professional Seminar I 1 Career planning and preparation for interior design.

403 Professional Perspectives 3 Same as AgHE 403.

425 Advanced Planning and Design I 5 (0-10) Prereq 1 D 333. Design solutions and presentation drawings for interior/commercial thesis projects based on program needs.

426 Advanced Planning and Design II 5 (0-10) Prereq 1 D 425. Design problem-solving, programming, and presentation drawings for interior/commercial thesis projects based on program needs.

490 Professional Internship 2 (0-6) May be repeated for credit; cumulative maximum 6 hours. Prereq 1 D 333. Supervised experience in an approved design firm or related business.

491 Professional Seminar II 1 Prereq 1 D 391.

495 Instructional Practicum V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prereq senior standing. By interview only.

498 Special Topics in Interior Design V 1-3 May be repeated for credit; cumulative maximum 9 hours.

499 Special Problems V 1-4 May be repeated for credit.

597 Advanced Design Theory 3 (1-6) Prereq 1 D 425. Current research in environmental and product design and development.

598 Topics in Interior Design V 1-3 May be repeated for credit; cumulative maximum 6 hours. Perception and use of interior space affecting human behavior in both residential and commercial interiors.

600 Special Projects or Independent Study 3 Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit. (for master's in H E only)

702 Master's Special Problems, Directed Study, and/or Examination Variable credit. (for master's in H E only)

Schedule of Studies

INTERIOR DESIGN
At least 40 of the total hours required for the bachelor's degree in interior design must be in upper-division courses. Courses required for the completion of an option cannot be taken on a pass/fail basis.

Freshman Year

First Semester

I D 101 Basic Env Design 3
Engl 101 Eng Comp 3
Math 101* or Elective (GUR) 3
Arch 120** (GUR) 3
PUSH 130 Nutrition for Man (GUR) 3

Second Semester

Com Prof (GUR) 3
P A 110 or 111 3
Psych 105 (GUR) 3
Arch 121** (GUR) 3
Chem 101 (GUR) 4

Sophomore Year

First Semester

I D 101 Graphic Com I 3
I D 201 Com & Perc I 3
I D 211 History of Design I 3
C T 215 Textiles Fund 3
Soc 101 or Anth 101 (GUR) 3

Second Semester

Arch 102 Graphic Com II 3
I D 203 Com & Perc II 3
I D 212 History of Design II 3
Phys 360 3
I D 202 Built Environment 3

Junior Year

First Semester

Hours

I D 321 Fund Res Plan 4
CPS 240 or 247 3
F A 331 3
I D 311 History of Design III 3
Arch 331 Materials 3

Second Semester

I D 333 Fund Com Plan 4
F A 380 Photography 3
I D 403 Prof Perspective 3
I D 325 Lighting 3
Intercultural Studies Elective*** 3
I D 391 Prof Seminar I 3

Senior Year

First Semester

Hours

Arch 434 Acoustics 1
I D 425 Adv Plan & Dan 5
I D 491 Seminar II 3
I D 498 or Supportive Elective 3
Elecive 2
CPS 333 Housing 3

Second Semester

I D 426 Adv Plan & Dan 5
Supportive Elective 2
Elecive 3

Supportive Electives (at least 3 hours in I D 498 Topics): C T 318; I D 490, 498, 499; Arch 201, 232, 324, 423, 424; A LA 264; Hort 332; F A 302, 303, 304, 312, 313, 322, 332, 340, 350, 360; Econ 201; B Law 210; transfer interior design hours as approved by the department.

A maximum of 4 credit hours of I D 499, Special Problems may be applied toward completion of the Interior Design degree.

*Score of 25 or better on Washington Pre-College Mathematics Examination.

**Recommended as Supportive Elective if Humanities GURs are complete.

***Required of all entering and subsequent students as of Fall, 1985.

Preparation for Graduate Study
Normally the applicant for graduate study should have an undergraduate major in Clothing and Textiles or Interior Design. However, candidates with a good record in related fields may be well prepared for certain areas of advanced study. Students from related disciplines would be required to take some courses required of undergraduate majors in these fields.

Department of Communications


The curricula in the Department of Communications are designed to prepare students for careers in the mass media and communication-related fields. Although focus is placed on the knowledge...
and skills essential in these areas, the department builds on a firm base of liberal undergraduate education drawn from other academic disciplines.

Theoretical training and laboratory workshop methods are combined with practical experience on student publications, including daily newspapers, the activities of campus-based television and radio stations, and an internship program.

Students may follow a general course of study leading within the department, or may select a primary area of interest: undergraduate level courses; advertising, broadcasting, journalism, speech communication, or public relations.

The Department offers courses of study leading to the degrees of Bachelor of Arts in Communication and Master of Arts in Communication. Graduate programs are offered in mass communications and speech communication.

Teacher training is done in cooperation with the Department of Elementary and Secondary Education, and a major in agricultural communications is offered in cooperation with the College of Agriculture and Home Economics.

**Description of Courses**

Enrollment in all 300- and 400-level courses, except PR 312 and GU/CR courses is limited to certified Com majors or certified majors whose degree programs require these courses.

For explanation see Index under "Symbols"

**Intersequence Courses**

Com

101 [H] Mass Communications and Society 3 (Same as Soc 373)

225 Newswriting 3 (2-3) Prereq demonstrated proficiency in typing, grammar, spelling and punctuation. The typing proficiency requirement will be waived on an individual basis for otherwise qualified handicapped students. 

245 Language and Human Behavior 3 Language as it influences human behavior in meaning production, problem solving, conflict management, media campaigns, and construction of social reality.

253 Photocommunications 3 (2-3)

270 Introduction to Communication Theory 3 Theory as a basis for systematic examination of phenomena in human and mass communication research.

372 Mass Communications and Public Opinion 3 (Same as Soc 373)

395 Communications Practicum V 1-6 May be repeated for credit; cumulative maximum 6 hours. By interview only. Credit not granted for both Com 395 and 495.

401 Topics in Communications 3 Study Abroad (London).

402 Topics in Communications 3 Study Abroad (London).

410 History of Mass Communications 3 For seniors and graduate students. Credit not granted for both Com 410 and 510.

415 Law of Mass Communications 3 For juniors, seniors and graduate students. Credit not granted for both Com 415 and 515.

420 New Communication Technologies 3 New communication technologies, their impact on communication processes, access, regulation, and communication in organization/professional contexts. Credit not granted for both Com 420 and 520.

440 Media Ethics 3 Foundations and frameworks of media ethics; case studies in assessing media performance. Credit not granted for both Com 440 and 540.

450 Mass Media and the First Amendment 3 Theoretical and philosophical bases of press and government interaction, namely the First Amendment. Credit not granted for both Com 450 and 550.

453 Color Photography 3 (2-3) Prereq Com 251.

460 Mass Media Criticism 3 Theoretical and philosophical basis for critical analysis of research in news and news determinants. Credit not granted for both Com 460 and 560.

470 Mass Communication Theories and Theory Construction 3 Traditional and new theories of mass communications and the process of theory construction. Credit not granted for both Com 470 and 570.

480 Media Management 3 For seniors and graduate students.

490 Quantitative Research Methods 3 Measurement, questionnaire construction, sampling, data collection techniques, analysis and hypothesis testing related to communication research needs. Credit not granted for both Com 490 and 590.

495 Professional Internship V 1-12 By interview only. Credit not granted for both Com 495 and 495.

499 Special Problems V 1-4 May be repeated for credit.

501 Theory Building in Communications 3 Relationship of research to theory development; evaluation of current theory and research; planning and executing research within specified theoretical frameworks.

510 History of Mass Communications 3 Graduate level counterpart of Com 410; additional requirements. Credit not granted for both Com 410 and 510.

515 Law of Mass Communications 3 Graduate level counterpart of Com 415; additional requirements. Credit not granted for both Com 415 and 515.

520 New Communication Technologies 3 Graduate level counterpart of Com 420; additional requirements. Credit not granted for both Com 420 and 520.

524 Criticism of Public Address 3 Graduate level counterpart of SpCom 424; additional requirements. Credit not granted for both SpCom 424 and 524.

525 (SpCom 525) Rhetorical Theory 3 Major theories from Aristotle to Kenneth Burke; analysis of symbolic action in public, political discourse.

535 (SpCom 535) Seminar in Training and Consultation 3 May be repeated for credit; cumulative maximum 6 hours. Instructional aspects of training and consultation in organizational communication; teambuilding, presentational skills, conflict resolution, assessment, leadership, group dynamics.

540 Media Ethics 3 Graduate level counterpart of Com 440; additional requirements. Credit not granted for both Com 440 and 540.

550 Mass Media and the First Amendment 3 Graduate level counterpart of Com 450; additional requirements. Credit not granted for both Com 450 and 550.

560 Mass Media Criticism 3 Graduate level counterpart of Com 460; additional requirements. Credit not granted for both Com 460 and 560.

570 Mass Communications Theories and Theory Construction 3 Graduate level counterpart of Com 470; additional requirements. Credit not granted for both Com 470 and 570.

580 Topics in Communication 3 May be repeated for credit; cumulative maximum 6 hours. Contemporary or technical topics in communication.

585 (SpCom 585) Interpersonal and Small Group Communication 3 Theory and research in interpersonal and small group communication.

590 Quantitative Research Methods 3 Graduate level counterpart of Com 490; additional requirements. Credit not granted for both Com 490 and 590.

591 Qualitative Research Methods 3 Historical, critical, and legal methodologies for theory-based evaluative, and policy studies in communication.

599 (SpCom 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 Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

**Advertising**

**Adver**

280 Advertising Principles and Practices 3 Not open to freshmen.

380 Advertising Copywriting and Creative Strategies 3 (2-3) Prereq Adver 280; major in Com. Development of effective advertising copy and creative strategies.

382 Media Planning 3 Prereq Adver 280; major in Com. Media planning theories, strategies, and practices.

395 Advertising Practicum V 1-6 By application only. Credit not granted for both Adver 395 and 495.

475 Seminar in Advertising 3 By interview only. May be repeated for credit; cumulative maximum 9 hours. For seniors and graduate students.

480 Advertising Agency Operation and Campaigns 3 (2-3) Prereq Adver 380, 382.

495 Professional Internship V 1-12 By interview only. Credit not granted for both Adver 395 and 495.

499 Special Problems V 1-4 May be repeated for credit.

**Broadcasting**

**Bdct**

255 Introduction to Broadcasting and Broadcast Production 3 (2-3) Prereq Com 225.

355 Television Writing and Production 4 (2-6) Prereq Bdct 255; for juniors and seniors.


395 Broadcasting Practicum V 1-6 By application only. Credit not granted for both Bdct 395 and 495.

458 Television Workshop 3 (1-6) Prereq Bdct 355. May be repeated for credit; cumulative maximum 6 hours.

465 Broadcast News Writing, Reporting, and Editing 3 (2-3) May be repeated for credit; cumulative maximum 6 hours. Prereq Bdct 365.
Department of Communications

475 Seminar in Broadcasting 3 May be repeated for credit; cumulative maximum 9 hours. By interview only. For seniors and graduate students.

495 Professional Internship V 9-12 By interview only. Credit not granted for both Bdcst 395 and 495.

499 Special Problems V 1-4 May be repeated for credit.

Jour
305 Reporting 3 Prereq Com 225.
325 Specialized Reporting 3 Prereq Jour 305.
330 News Editing 3 (2-3) Prereq Jour 305.
395 Journalism Practicum V 1-6 By application only. Credit not granted for both Jour 395 and 495.

425 Reporting of Public Affairs 3 Prereq Jour 305. For seniors and graduate students.

430 Critical Writing 2
475 Seminar in Journalism 3 By interview only. May be repeated for credit; cumulative maximum 9 hours. For seniors and graduate students.

495 Professional Internship V 9-12 By interview only. Credit not granted for both Jour 395 and 495.

499 Special Problems V 1-4 May be repeated for credit.

Public Relations
P R
312 Public Relations 3 Prereq Com 225.
313 Public Relations Writing and Editing 3 (2-3) Prereq Jour 305; P R 312.
395 Public Relations Practicum V 1-6 By application only. Credit not granted for both P R 395 and 495.

413 Public Information 3 Prereq P R 312. For seniors and graduate students.

475 Seminar in Public Relations 3 By interview only. May be repeated for credit; cumulative maximum 9 hours. For seniors and graduate students.

495 Professional Internship V 9-12 By interview only. Credit not granted for both P R 395 and 495.

499 Special Problems V 1-4 May be repeated for credit.

Speech Communication
SpCom

185 (101) Principles of Interpersonal Communication 3 Theory and practice of interpersonal communication; understanding and applying interpersonal information in interpersonal settings.

235 [C] Principles of Group Communication 3 Theoretical and practical aspects of communication in groups; classroom exercises and films demonstrate theoretical principles.

251 Oral Interpretation of Literature 3 Analyzing and oral reading of prose, poetry, and drama; sharing literature with an audience.

302 [C] Advanced Public Speaking 3 Advanced principles of public speaking and their practical implementation for effective communication.

324 (330) [C] Argumentation 3 Theory and analysis of the types of arguments in everyday use.

334 (331) Deliberative Decision-Making 3 Debate; researching the topic, case construction, analysis, and practice debating.

351 Advanced Interpretation 3 Voice and dictation, interpretation of copy for broadcast.

385 (301) Advanced Principles of Interpersonal Communication 3 Prereq SpCom 185. Theoretical literature relevant to analyzing relationships; students use this information to analyze a relationship.

395 Speech Communication Practicum V 1-6 By application only. Prereq SpCom 435. Credit not granted for both SpCom 395 and 495.

401 Persuasion 3 Theory and practice of persuasive speaking.

424 (425) Criticism of Public Address 3 Analysis and criticism of significant speakers, campaigns, and movements; political rhetoric in contemporary and historical settings. Credit not granted for both SpCom 424 and Com 524.

435 (400) Application of Communication Theory 3 Exstant communication theory; its application in an occupational setting.

485 (465) Applied Interpersonal Communication 3 Prereq SpCom 185, 385, or juniors and seniors in Educ, Psych, or S W. How a person relates to others; cognitive and affective parts of the process.

488 (415) Structure of Conversation 3 Verbal and nonverbal symbol systems and their interrelation in communication.

495 Professional Internship V 9-12 By interview only. Prereq SpCom 435. Credit not granted for both SpCom 395 and 495.

499 Special Problems V 1-4 May be repeated for credit.

Speech Communication: General Departmental Requirements
Each student will complete the requirements of one of the following sequences and accumulate a minor of 18 hours in a second department. At least 9 of the 120 hours required for the Bachelor of Arts degree in Communications must be taken in other departments. Transfer students, in meeting the requirements of their chosen sequence, may take a minimum of 15 credit hours in the department.

SEQUENCE REQUIREMENTS
All sequences require a minimum of 36 semester hours in Communications.

Advertising
Issues/Institutes/Organizations (6 hours): Adver 280 plus one of Com 410, 415, 440, or 450. Pre-Professional (9 hours): Adver 380, 382, 480. Theory (6 hours): Adver 475 plus one of Com 373, 460, 470, 490. Enrichment (6 hours): Adver 395 or 495 or 6 hours upper-division communications courses; Mktg 360.

Broadcasting
Pre-Professional (9 hours): Bdcst 255 plus 365 and 465, or 355 and 435. Issues/Institutes/Organizations (6 hours): Com 415, plus one of Com 410, 420, 440, 450, or 481. Theory (6 hours) Bdcst 475, Com 373, 460, 470, or 490. Enrichment (6 hours): Bdcst 395 or 495 or 6 hours upper-division communications courses.

General Communications
At least 36 hours in communications, advertising, broadcasting, journalism, public relations, or speech communication is worked out by the student and the department chairperson prior to certification of major in this sequence.

Journalism
Pre-Professional (9 hours): Jour 305, 330, 425. Issues/Institutes/Organizations (6 hours): Com 415 plus one of Com 410, 420, 440, or 450. Theory (6 hours): Jour 475 plus one of Com 373, 460, 470, or 490. Enrichment (6 hours): Com 253, Jour 395, 495, or 430, or 6 hours upper-division communications courses.

Public Relations
Pre-Professional: 3 hours from SpCom 185, 235 or 485; 3 hours from SpCom 231, 302, or 351; 3 hours from SpCom 324 or 334. Issues/Institutes/Organizations (6 hours): SpCom 435, 440, 424, Theory (6 hours): SpCom 385, 401, or 484. Enrichment (6 hours): SpCom 495 or 6 hours upper-division communications courses.

DEPARTMENTAL MINORS
Students declaring a minor in communications must choose one of the following sequences and complete a minimum of 18 hours, including 9 upper-division hours and the following required courses: Advertising: Com 225; Adver 280, 380, 382. Broadcasting: Com 225, Bdcst 255, Com 415, Bdcst 475. Journalism: Com 225, Jour 305, 330, 425, Com 410, 415. Public Relations: Com 225, Jour 305; P R 312, 313, 413. Speech Communication: 18 hours of approved SpCom courses.

Agricultural Communications
This is a major in the College of Agriculture and Home Economics in cooperation with the Department of Communications. The student declaring this major must complete the requirements of the general agricultural curriculum and accumulate a minimum of 30 hours in the Department of Communications, including any communications courses used to satisfy general agricultural requirements. Those electing this major should make that decision known as early as possible in their academic careers.
majors should complete the following: Print Media: Com 225; Jour 305; Com 253; P R 312, 313, 413; Com 490 and 9 elective hours in the Department of Communications. Broadcast Media: Com 225, Bcdest 255, 355, 365; P R 312, 313, 413; Com 490, and 6 elective hours in the Department of Communications. The student should consult with a Department of Communications advisor before registering for elective courses. Specialized programs patterned for the individual career aspirations may be developed in conjunction with the head of the Department of Communications or a designated representative.

Teacher Training

Students preparing to teach should consult the catalog listing of the Department of Elementary and Secondary Education for certification requirements. Students majoring or minoring in communications for purposes of teacher certification should make that intent known to the head of the Department of Communications as early as possible in their academic career.

Department of Comparative American Cultures

Associate Professor and Department Chair, A. Kuo; Professor, P. Hard; Associate Professors, T. Anderson, F. Padilla; Assistant Professors, D. Culverstone, J. M. Hernandez-G., G. Nomura, J. Peterson, E. Smith, S. Sumida.

The Department of Comparative American Cultures offers courses of study in Asian/Pacific American Studies, Black Studies, Chicano Studies, and Native American Studies (see alphabetical listings).

Asian/Pacific American Studies offers an interdisciplinary study of Asian Americans, with an emphasis on their lives, roles, and achievements. The curriculum is designed to provide a broad, systematic understanding of Asian Americans, quite distinct and apart from the traditional cultures of their origins. A minor in Asian American Studies is offered.

The Black Studies Program examines from an interdisciplinary approach the historical, social, political behavior and economic experience of Afro-Americans and people of African descent throughout the world. The course of study leads to the degree of Bachelor of Arts in Black Studies. Eighteen credit hours in Black Studies have been approved as a minimum requirement for a minor in Black Studies.

Chicano Studies offers a major which leads to the degree of Bachelor of Arts in Chicano Studies. Although some upper-division courses could apply as support work for graduate study in some departments, this program does not offer an advanced degree. The program also offers a minor in Chicano Studies and courses for the teaching major leading to Bilingual-Bicultural Education (Spanish-English) Certificate Endorsement.

The Native American Studies Program offers a minor which requires a minimum of 16 hours of credit, half of which must be upper-division course work. The curriculum is designed to offer interdisciplinary study in a wide spectrum of courses to provide a broad knowledge of Native American culture.

Description of Courses

For explanation see Index under "Symbols"

CAC
400 Comparative American Agriculture and Culture 3 Non-European foundations of American agriculture and farm cultures.

495 Special Topics in Comparative American Cultures 2 May be repeated for credit; cumulative maximum 6 hours. Prerequisite course in CAC. Cross-cultural studies on Asian/Pacific Americans, Blacks, Chicanos, and Native Americans.

499 Special Problems V 1-4 May be repeated for credit.

Department of Computer Science

Associate Professor and Chair, R. E. Lord; Professors, D. B. Benson, N. Deo, G. Marsaglia, R. A. Parker, K. C. Wang; Associate Professors, A. C. Gen, C. E. Kim, M. A. Langston, R. E. Lord; Assistant Professor, G. R. Cross; Visiting Associate Professor, W. M. Kinnersley; Visiting Assistant Professor, R. W. Clark; Program Coordinator at Tri-Cities University Center, D. J. Lynch; Adjunct Professor, L. G. Nicosi, K. A. Ekblaw, L. J. Gannon, M. E. Mahan, T. J. Mathieu, R. B. Melton, M. G. Piepho, S. D. Rosier, T. A. Seim, W. E. Wilson.

Computer science encompasses the theory and techniques by which information is encoded, stored, communicated, transformed, and analyzed. It deals particularly with the theory of algorithms, (i.e., effective procedures), with the structure of languages for the expression of algorithms, and with the design of efficient algorithms for the solution of practical problems. Of central concern is the study of computer systems (hardware and programs) for the automatic execution of these algorithms.

Computer science has its principal bases in engineering and mathematics. In addition, it draws upon concepts from a wide variety of other disciplines such as linguistics, psychology, biology, philosophy, and economics. It has applications to these and other disciplines.

Facilities at the Western Carolina University Computing Service Center include an IBM 3090 and VAX 11/785. The department owns 3290 Series 68, a HP 9000, a VAX 11/730, a R icon 32, many LS microcomputer systems, and other microcomputers, a Tektronix 4129/4129 graphic system, two Tektronix 4404 A1 machines, a DeAnza graphic-imaging system and two eight-digit color plotters.

A digital techniques laboratory is used for research and instruction in high-speed logic circuits, and digital communications.

The department offers courses of study leading to the degrees of Bachelor of Science in Computer Science, Master of Science in Computer Science, and Doctor of Philosophy.

Description of Courses

For explanation see Index under "Symbols"

Cpt S
105 Computer Software in Business 4 Computer software applications in business planning, management, and development; elementary computer architecture; computer selection and configuration.

140 Concepts of Computer Science 3 Prereq Math 107 or c/. Foundations of computer science and computation; capabilities and uses of computers.

150 Program Design and Development 4 Prereq Math 107. Formulation of problems and top-down design of programs in a modern structured language for their solution on a digital computer.

151 FORTRAN Programming 2 Comprehensive programming practice using FORTRAN.

153 BASIC Programming 2 Comprehensive programming practice using BASIC.

203 Computer Programming for Engineers 2 Prereq Math 171. Use of FORTRAN in solving problems related to engineering applications. WSU Scientific sub-routine Library. Credit not granted for both Cpt S 151 and 203.

216 (316) Discrete Structures 3 Prereq Cpt S 150 or Math 171; FORTRAN programming course. Discrete mathematics, trees, graphs, elementary logic, and combinatorics with application to computer science.

240 Programming Language 2 May be repeated for credit; cumulative maximum 4 hours. Prerequisite Cpt S 150; Cpt S major. Advanced concepts of languages learned in 150, 151, 153 or a different programming language.

241 COBOL Programming 2 Prereq Cpt S 150 or c/. Comprehensive programming practice using COBOL.

250 Advanced Programming 3 Prereq Cpt S 150. Advanced programming techniques: data structures and program design principles; nonnumeric computing.

260 Computer Organization and Programming 3 (3-2) Prereq Cpt S 150. Organization of digital computers: concepts and examples in machine and assembly language programming; laboratory experience with a small computer.

317 Automata and Formal Languages 3 Prereq Cpt S 216. Finite automata, regular sets, pushdown automata, context-free languages, Turing machines and halting problem.

330 Numerical Computing 3 Prereq FORTRAN programming course; Math 172. Design and implementation of various numerical algorithms in FORTRAN; use of library routines in solving numerical problems.

335 Principles of Optimization 3 Same as Math 364.

350 Data Structures and Data Management 3 Prereq Cpt S 216, 250. Data structures and their applications in storage and file management and in data base systems.

360 Systems Programming 4 (3-3) Prereq Cpt S 250, 260; Cpt S major. Implementation of systems programs, concepts of computer operating systems; laboratory experience in using operating system facilities.

370 Systems Analysis and Design 3 Prereq Cpt S 150 or 241. Analysis and design of computer-based systems typically found in a business environment; related programming projects.

405 The Use of Computer Systems 3 For non-majors. Not open to freshmen or sophomores. Computers, computer systems, and software packages for advanced students in other disciplines; licenture use. No previous computer experience required.

420 Fundamentals of Digital Systems 3 Same as E E 414.
Certification Requirements

To work towards the Bachelor of Science degree in Computer Science a student must meet formal certification requirements established by the department. Students planning to pursue this degree must complete Cpt 150, 216, and 250, Math 171 and 172, and 3 hours satisfying General University Requirements as written communication (W) course (e.g., Engl 101). During the semester in which the last of these requirements is being fulfilled the student must apply for certification into the Computer Science Department. Application forms may be obtained from the department office; the forms must be filled out and turned in to the departmental office no later than the last Friday of classes of the current semester. Certification will be based on two factors: (1) the g.p.a. in the required courses listed above, and (2) overall grade point average. The number of students certified each semester will be determined by available positions and resource restrictions. Students will be notified of their certification decision before the start of the subsequent semester to allow proper advising. Students who are denied may appeal to the head of the department. The appeal must be in writing and submitted to the Computer Science office no later than the Friday of the second week of the subsequent semester. Women and minorities are encouraged to apply. Special consideration will be given to affirmative action candidates.

Schedule of Studies

An undergraduate major is required to complete 39 credits of computer science courses. Twenty-six of these credits must be from courses at the 300-level or above. Required courses are Cpt 150, 151, 216, 250, 260, 317, 330, 350, 495; the remaining credits may be chosen from any of the course offerings in the department except Cpt 105 and 405. In addition, students must complete Math 171, 172, 220, and Stat 360, along with E E 214, Phil 201, and Engl 402. In order to emphasize that computers are not only a source of deep and stimulating intellectual problems but are also machines designed to do useful work, each major is also required to complete 15 credits of computer work in an area of applied work. The remaining credits must include at least 9 credits of formal course work at the upper-division level. These optional courses are subject to the approval of the student's adviser. They all may be selected from a single department or from a group of related departments. If mathematics is chosen as the optional area the student must complete Math 273 and 9 upper-division credits beyond those already required for the degree in computer science. A grade of C- or better is necessary in all courses used to satisfy the above requirements.

Off-campus work-study internships at cooperating industrial firms and governmental computer installations are frequently arranged through the Professional Experience Program (PEP) at Washington State University. Students selected for an internship involving a summer plus one full semester (approximately seven and one-half months) of work experience may enroll for 9 credits or less of Cpt 490. This experience is supervised jointly by the computer science faculty and the professional staff of the cooperating organization. Only those students may be applied toward the 39 credits required for the degree in computer science.

The department also offers an undergraduate minor, which requires the completion of 16 credits
in computer science, nine of which must be in formal upper-division courses.

Preparation for Graduate Study
As preparation for work toward an advanced degree, students should have completed an undergraduate degree in a field in which they have studied significantly complex physical, biological, or social systems, and have taken mathematics at least through elementary calculus and beginning linear algebra. Students should have completed courses equivalent to Cpt S 150, 216, 250, 260, 330, and 360. Students who have not been able to acquire an adequate background in computer science may enter the program only after removing this deficiency by completing the above sequence.

Department of Counseling Psychology

Professor and Department Chair, D. A. Warner; Professors, T. Akamine, A. F. Barabasz, W. F. McDougal; Associate Professors, J. T. Shoemaker, K. P. Swoope; Assistant Professors, M. Barabasz, A. T. Church, E. A. Helmstetter, R. R. Murphy, C. A. Peck; Instructor, L. Ehlers Peck.

The department offers courses of study leading to the degrees of Bachelor of Arts in Education, Master of Education, Master of Arts in Education, Doctor of Education, and Doctor of Philosophy (Education). Study in the following fields of specialization is possible through the Department of Counseling Psychology: special education (undergraduate study only), counseling (master's level study), counseling psychology (doctoral level study), and educational psychology (master's and doctoral level study).

Admission to Special Education
Students are accepted as majors in Special Education following completion of 30 semester hours of courses. Criteria for acceptance are (a) a minimum cumulative grade point average of 2.5 based upon 30 semester hours or more of college level courses, (b) successful performance on the SAT, ACT, or Washington Pre-College Test, (c) grade of C or better in English 201 or an equivalent sophomore composition course, (d) an interview with a Special Education faculty member, and (e) completion of 50 clock hours of volunteer work with persons with disabilities.

Students make application to the Department of Counseling Psychology by completing a declaration of major card. Applications are reviewed by the faculty on an individual basis and notification of acceptance or rejection is given in writing by the chair of the department.

Admission to Graduate Study
Individuals applying for admission to the graduate study must submit the following materials to the Chair of the Department of Counseling Psychology:
- a letter of application describing professional objectives;
- completed departmental application form;
- Graduate Record Examination scores (Aptitude);
- official college transcripts; and
- three letters of recommendation from individuals qualified to comment on the applicant's academic and professional abilities.

For persons interested in the PhD specialization in Counseling Psychology, the department considers applications for admission only once a year. These applicants must submit their materials to the chair of the department by March 1 for admission the following fall semester.

Applications for admission to a graduate program are reviewed by faculty on an individual basis and notification of the faculty's action is provided in writing by the chair of the department.

ESA Counselor Certification
The Department of Counseling Psychology at Washington State University is involved with Southeastern Washington school districts in a Counseling Education Consortium. The EdM and MA specializations in Counseling constitute a consortium directed program approved by the State Board of Education. Completion of this program qualifies a person for initial certification as a school counselor in the state of Washington. Post-master's degree coursework is also available leading to continued counselor certification.

Further information may be obtained by writing: Co-Director, WSU Counselor Education Program Unit, Department of Counseling Psychology, Room 321 Cleveland Hall, Washington State University, Pullman WA 99164-2131.

Description of Courses
For explanation see Index under "Symbols"

Counseling Psychology
CoPsy 385/389 Communication, Cultures, and Careers 2 Prereq: Ei/Se 303. Social, psychological and multicultural issues; human relations, ethnic concerns, sexism, career education; teaching responsibilities.
490 Instructional Practicum V 1 (0-3) to 3 (0-9) May be repeated for credit; cumulative maximum 8 hours.
499 Special Problems V 1-4 May be repeated for credit.
511 (Ed 534 & 535) Theories, Research, and Techniques in Counseling Psychology 1-4 Philosophical assumptions, theory of personality, counseling process, techniques and relevant research in the major theories of counseling and psychotherapy.
512 (Ed 559) Theories, Research, and Techniques in Counseling Psychology II 2 Prereq CoPsy 511. Advanced counseling theory; interpretation of theories and principles of counseling psychology.
513 (Ed 557) Career Development 3 Theories, concepts, methods, and findings in career development; vocational assessment and prediction, career counseling interventions and outcomes.
515 (Ed 556) Professional Problems in Counseling Psychology 3 Prereq: CoPsy 512, 513, 527. Seminar in professional problems; ethical, legal, and training issues, professional practices, and new professional issues.
518 (Ed 592) Theoretical Foundations of Group Counseling 3 Prereq: CoPsy 512. History, philosophy, and theoretical foundations; the group counselor, members, and issues in group counseling. Joint listing with the University of Idaho (Guid ID564).
523 Topics in Counseling Psychology V 1-4 May be repeated for credit; cumulative maximum 6 hours. Recent research, developments, issues, and applications in selected areas of education.
527 (Ed 558) Individual Appraisal I 4 Prereq: EdPsy 508, 509. Theoretical background and practical skills needed to administer, score, and interpret individual intelligence and structured personality tests; integration of non-test data. Joint listing with the University of Idaho (Guid ID525).
528 Individual Appraisal II 3 Prereq: CoPsy 527. Theoretical and empirical bases, psychometric properties, administration, scoring, and interpretation of major projective techniques; emphasis on Rorschach and TAT.
535 Master's Practicum in School Counseling V 3 (2-3) to 6 (4-6) May be repeated for credit; cumulative maximum 6 hours. Prereq CoPsy 511, 513; CoPsy 512 or c/c. Supervised experience in the application of guidance and counseling theory and techniques in a school setting.
536 Continuing Counseling ESA Certification 3 or 6 May be repeated for credit; cumulative maximum 6 hours. Prereq Initial Certification. Continuing level generic standards for ESA Certification, staff development, supervision, professional development, referral, consultation, and program development.
551 Doctoral Practicum in Counseling Psychology 1-4 (2-6) Prereq: CoPsy 512, 513, 515. Supervised experiences in the application of counseling psychology theory and techniques.
552 Doctoral Practicum in Counseling Psychology II 4 Prereq: CoPsy 551. Supervised experiences in the application of counseling psychology theory and techniques.
553 Doctoral Practicum in Counseling Psychology III 5-8 May be repeated for credit; cumulative maximum 8 hours. Prereq CoPsy 551. Supervised experiences in the application of counseling psychology theory and techniques.
560 (Ed 563) Seminar in Research in Counseling Psychology 4 By interview only. Recent developments in counseling psychology research and design applied to PhD dissertation proposals.
579 Counseling Psychology Internship 5 or 10 May be repeated for credit; cumulative maximum 20 hours. Supervised internship experience, individual and group counseling, evaluation, assessment, supervision, and teaching.
600 Special Projects or Independent Study Variable credit.
700 Master's Research, Thesis, and/or Examination Variable credit.
702 Master's Special Problems, Directed Study, and/or Examination Variable credit.
800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Education Psychology
EdPsy 301 Educational Psychology 4 Prereq: Psych 102; Ei/Se 300. Not open to freshmen or first semester sophomores. Theories and principles of psychology applied to teaching; human development, learning, motivation, and social/emotional adjustment of students.
322 Topics in Student Personnel Work 2 or 3 Educational psychology, theories of human behavior, and legal and ethical considerations related to student personnel work.
Program in Criminal Justice

322 Topics in Student Personnel Work 2 or 3
Educational psychology, theories of human
behavior, and legal and ethical considerations
related to student personnel work.

401 Evaluation of Learning, Elementary 2 Prereq
El/Se 305 or 320. Theory and methods of
evaluating pupil progress in the elementary
schools.

402 Evaluation of Learning, Secondary 2 Prereq
El/Se 303. Theory and methods of evaluating
pupil progress in the secondary school.

478 Career Development and Vocational
Guidance for the Handicapped 3 Prereq ma-
jor in College of Educ. Concepts of career
development and vocational guidance and
counseling related to the needs of the
handicapped.

490 Instructional Practicum V 1 (0-3) to 3 (0-9)
May be repeated for credit; cumulative max-
imum 8 hours.

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.

502 Advanced Educational Psychology 3 Prereq
EdPsy 301. The interpretation of funda-
mental psychological facts, theories, and prin-
ciples applying to education.

505 Research Methods I 3 Research methods;
literature review, design, implementation,
and interpretation of results.

508 Educational Statistics 3 Prereq EdPsy 401 or
402. Descriptive statistics: central tendency,
variability, correlations, and regressions; in-
troduction of tests of significance; reporting
and interpreting educational research data.

509 Educational Measurements 2 or 3 Prereq
EdPsy 508. Theory and use of standardized
educational measurement devices; intelli-
gence, aptitude, and achievement tests.

519 Practicum in College Instruction 1 (0-3) May
be repeated for credit; cumulative maximum
4 hours. By interview only. Supervised ex-
perience in college teaching.

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.

555 Education of the Gifted and Talented 2 or 3
Prereq 9 hrs Educ. Provisions for the iden-
tification, education, and counseling of gifted
and talented persons, preschool through
adolescence.

556 Advanced Educational Statistics 3 Prereq
EdPsy 508. Applications of inferential
statistics in educational research and
evaluation.

566 Attitude Scaling Techniques 3 Prereq EdPsy
509. Theory of scaling; development of tech-
niques for appraising attitudes, interests, and
appreciation.

573 Program Evaluation 3 Prereq EdPsy 509.
Strategies and techniques for evaluation of
educational programs.

568 Research Methods II 3 Prereq EdPsy 505, 565.
Integration and application of research skills
in writing proposals, dissertations, papers for
publication; interpreting, critiquing, and syn-
thesizing research studies.

569 Seminar in Quantitative Techniques in Educa-
tion or 3 May be repeated for credit;
cumulative maximum 6 hours. Prereq EdPsy
565. Application of parametric and non-
parametric statistics, data processing using
computer packages in educational research.

600 Special Projects or Independent Study
Variable credit.

700 Master's Research, Thesis, and/or Examina-
tion Variable credit.

702 Master's Special Problems, Directed Study,
and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Ex-
amination Variable credit.

Special Education

Sp Ed

301 (Educ 455) Education of Exceptional Children
3 Classification, developmental characteris-
tics, and etiology of exceptional children;
research and methods of instruction in the
classroom.

401 (Educ 446) Analysis and Management of Ex-
ceptional Behavior 3 (2-3) Prereq EdPsy 301;
Sp Ed 301. Intervention strategies and con-
tinuous progress measurement systems for
dealing with academic, social problems in
education settings.

402 Curriculum Modification and Development
in Special Education 3 Prereq Sp Ed 301, 401;
Psy 390. Concepts and techniques for de-
veloping, adapting, and evaluating curric-
ulum for students with handicaps.

403 (Educ 481) Methods in Secondary Special
Education 3 Prereq Sp Ed 301, 401; Psy 390.
Techniques, strategies, and curriculum for
working with secondary-aged and adult
individuals with handicaps.

404 Professional Skills in Special Education 2
Prereq Sp Ed 301; Psy 390. Communication,
problem solving, liability, record keep-
ing, professional development, program
evaluation.

409 Early Childhood Special Education 3 Prereq
Sp Ed 301, 401. Assessment, curriculum, and
instructional techniques for teaching young
children with handicaps and their families in
a variety of settings.

430 Atypical Development 3 Prereq Sp Ed 401.
Assessment and instructional strategies for
facilitating social, cognitive, and com-
municative development of children with
handicaps.

440 Curriculum and Instruction for Students with
Severe Disabilities 3 Assessment, curriculum
development, and instructional methods
utilized in the education of students with
severely handicapping conditions.

490 Practicum in Special Education V 1-3 May
be repeated for credit; cumulative maximum
8 hours. Supervised field experience in special
education.

Program in Criminal Justice

Associate Professor and Director, B. A. Menke;
Assistant Professors, M. C. Mathews, D. P.
Rogan.

The Criminal Justice Program (administratively
located in the Department of Political Science) of-
fers a liberal arts education in conjunction with
professional studies in the field of criminal justice.
The program is designed to prepare the stu-
dent to succeed in a broad range of careers (law enforce-
cement, correction, juvenile justice), educates them for
higher study, develops leadership qualities and
promotes the ideal of professional achievement
in public service.

The focus of the program is in the multi-
disciplinary study of crime and its control. The stu-
dent is exposed, in addition to general university
requirements, to the study of the components, pro-
cesses, and programs of the criminal justice
system. The criminal justice curriculum emphasizes
the study of crime and deviance, criminal law, and
social control, the criminal justice process, and
administration, management, and research in the
criminal justice system.

The student is required to complete a number
of collateral courses that focus on the larger social,
economic, and political environments in which
the criminal justice system operates. These collateral
courses, taught by a multi-disciplinary faculty,
prepare students in such diverse areas as public ad-
ministration, policy analysis, and research
methods. The curriculum defines a coherent pro-
gram of study that creates an awareness of the
complex array of forces in the genesis and control of
crime. Students will determine, in consultation with the faculty, the most
desirable schedule of courses to achieve their
objectives.

The program offers courses of study leading to
the degree of Bachelor of Arts in Criminal Justice and
Master of Arts in Criminal Justice.

Description of Courses

For explanation see Index under "Symbols"

Crm J

101 Introduction to the Administration of
Criminal Justice 3 Agencies and process
involved in the administration of criminal
justice.

150 Organizational Environment of Criminal
Justice 3 Prereq Crm J 101. Impact of
organizational structures and dynamics on
processes of decision making and the perfor-
manoe of criminal justice agencies.

210 Criminal Investigation 3 Prereq Crm J 101.
Theory and practice of investigation through
application of deductive and inductive reason-
ing; development and practice of field in-
vestigation. Cooperative course taught at the
University of Idaho (CJ ID210).

320 Criminal Law 3 Prereq Crm J 101. Substan-
tive criminal law; principles, functions, and
limits; basic crime categories, state and na-
tional legal research materials. Cooperative
course taught at the University of Idaho (CJ
ID320).

330 Strategies of Crime Control 3 Prereq Crm J
101. Analysis of ideologies, assumption, and
critical evaluation of multi-level crime control.

400 Issues in the Administration of Criminal
Justice 3 May be repeated for credit; cumu-
larive maximum 6 hours. Special issues in
criminal justice.

405 Comparative Criminal Justice Systems 3
Prereq Crm J 101. Comparative study of
criminal justice systems in the U.S. and
selected foreign countries. Credit not granted
for both Crm J 405 and 505.

420 Law of Evidence and Criminal Procedure
3 Prereq Crm J 101, 320. Principal court de-
cisions concerning standards of conduct and
rights in the criminal process; evidentiary
principles and privileges.

Impact of federal and state laws, court de-
cisions regarding corrections. (a/y)

445 Children and the Law 3 Prereq Crm J 101,
320. Social and legal perspectives on the
changing constitutional rights of children.
Cooperative course taught at the University of
Idaho (CJ ID445).

465 Juvenile Justice and Corrections 3 Prereq
Crm J 101. History, philosophy, legal pro-
cess, performance, and outcomes of the
juvenile justice and corrections systems.
The Police and Society 3 Prereq Crm J 101. Community and selected social institutional factors as related to their influence on police systems. Credit not granted for both Crm J 470 and 570.

Criminal Justice Internship V 1-12 May be repeated for credit; cumulative maximum 12 hours. Prereq major in Crm J. By interview only. Off-campus professional internship in selected criminal justice agencies.

Special Problems V 1-4 May be repeated for credit.

Comparative Criminal Justice Systems 3 Graduate level counterpart of Crm J 405; additional requirements. Credit not granted for both Crm J 405 and 505.

Criminal Justice Process and Institutions 3 Process of criminal justice in the context of the social, political, and economic environments.

Seminar in Criminal Justice Intervention 3 Interrelationship of ideology, data, policy development/implementation; policies and programs focused on major criminal justice decision points.

(55S) Planned Change in Criminal Justice 3 Analysis of change efforts aimed at individuals, organizations, and communities to reduce crime and improve the criminal justice system.

The Police and Society 3 Graduate level counterpart of Crm J 470; additional requirements. Credit not granted for both Crm J 470 and 570.

Criminal Justice Field Practicum 6 By interview only. Off-campus professional internship in selected criminal justice agencies.

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.

Topics in Criminal Justice 3 May be repeated for credit; cumulative maximum 6 hours. Policy formulation, administrative-management, evaluation research developments.

Special Projects or Independent Study Credit variable.

Master's Research, Thesis, and/or Examination Variable credit.

Minor in Criminal Justice

Minor in Criminal Justice requires 16 credits of coursework in criminal justice, half of which must be taken at the upper-division level. Students wishing to declare a minor in criminal justice should contact the Criminal Justice Program for details.

Department of Economics

The curriculum in economics addresses the disturbing problem that most of the American public's knowledge of basic economic forces is sadly deficient. Knowledge of economics is generally regarded as a prerequisite for many career fields. The course of study for economic majors is sufficiently flexible to accommodate study with a variety of career interests, including business, law, government, education, public administration, and general economics. The undergraduate economics major is also excellent preparation for graduate study in many fields, such as business, law, and economics. Courses of study in economics allow sufficient time for electing courses outside the department while meeting all departmental and General University Requirements.

The department offers courses of study leading to the degree of Bachelor of Arts in Economics, Master of Arts in Economics, and Doctor of Philosophy.

Description of Courses

For explanation see Index under "Symbols"

Econ


198 [S] Economics Honors 3 Introduction to economic theory and policy issues.

201 [S] Contemporary Economics and the American Economy V 4.5 Political economy of U.S.; macroeconomic theory, unemployment and inflation, corporate power, distribution of wealth, pollution. May be substituted for Econ 102 or 203.


201 Theory of the Firm and Market Policy 3 Prereq Econ 203, and 102 or 201. Price determination and market behavior under different market structures and the problems posed for public policy. Credit not granted for both Econ 201 and 302.

202 Intermediate Microeconomic Theory 3 Prereq Econ 203 or 201; Math 171 or 202. Microeconomic theory for majors in Econ and Ag Ec. Credit not granted for both Econ 301 and 302.

211 Introductory Econometrics 3 Prereq QMath 215, Econ 102, 203. Methods of empirical analysis in the context of actual forecasting problems, use of the computer in forecasting.

212 Economics of Consumption 3 Prereq Econ 203, and 102 or 201. Consumption expenditures and problems; theory of consumer choice; public policy and consumer welfare.

316 Urban and Regional Economics 3 Prereq Econ 301. Industry and population location within and among regions; city structure; growth and stagnation problems and policies of cities and regions.

320 Money and Banking 3 Prereq Econ 102 or 201. Principles of money, credit, banking, and national income analysis.

340 Public Finance and Taxation 3 Prereq Econ 102 or 201. Theory and practice of public finance and administration at local, state, and federal levels.

350 Labor Economics and Problems 3 Prereq Econ 301, and 102 or 201. Functioning of labor markets; introduction to collective bargaining and labor law.

360 Government and Business 3 Prereq Econ 203. Regulations of utilities, transportation, banks, communications; anti-trust law; protection of industries, consumers, environment, workers safety and rights.

*Open only to students in the Honors Program.
364 Transport Economics 3 Prereq Econ 301. Characteristics of transportation systems; market structure; case for and progress of public control of transport agencies.

401 Intermediate Macroeconomic Analysis 3 Prereq Econ 320; Math 171 or 202. Income, employment, and inflation theory with policy implications.

402 History of Economic Thought 3 Prereq Econ 102 or 201. Development of economic thought; classical and neoclassical schools, forerunners, and critics considered in relation to their historical setting.

408 Mathematics for Economists 3 Same as Math 408.

410 Elements of Mathematical Economics 3 Prereq Econ 301 or 302; Math 273. Introduction to mathematical optimization in economic theory.

411 Introduction to Econometrics 3 Prereq Econ 301 or 302. Econometric methods in relation to the substantive achievements of empirical econometrics.

416 Comparative Economic Systems 3 Prereq Econ 203 or 201. Key institutions, policies, and economic performance of capitalist and socialist systems; U.S., France, Japan, Sweden, Yugoslavia, Soviet Union, Poland, China.

420 Monetary Theory and Policy 3 Prereq Econ 320. Current issues in monetary economics with a special emphasis on policy.

430 American Economic History 3 Prereq Econ 301 or 302, and 102 or 201. Development and changes in the American economy from the colonial period to the present.

431 European Economic History 3 Prereq Econ 203, and 102 or 201. Development and changes in the European economy from prehistorical times to the present.

440 Fiscal Policy 3 Prereq Econ 320, 340. Theoretical and empirical impacts of public expenditure and taxes on the economy; recent changes in fiscal policy theories.


460 Concentration of Corporate Power and Antitrust Policy 3 Prereq Econ 301 or 302 and 102 or 201. Extent, causes, and effects of economic power held by U.S. corporations; antitrust laws and other legislation and regulatory business practices.

463 Urban Transportation Economics 3 Prereq Econ 301 or 302, and 364; QMath 215 or 311. Applications of basic microeconomics to urban transportation problems, urban transportation demand analysis, supply analysis, and system investment decision-making.

464 Freight Transportation Economics 3 Prereq Econ 301 or 302; 311, 364. Analysis of market structure, conduct, and performance of the intercity freight transportation industry using micro theory and basic microeconomics. (E/G)

470 International Finance 3 Prereq Econ 301 or 302, and 102 or 201. Analysis and description of international specialization; commercial policy; multinational firms, monetary problems.

472 Economic Development and Underdevelopment 3 Prereq Econ 301 or 302, and 102 or 201. Development theories, policies, and performance of Third World economies; population, land reform, foreign trade, aid, investment, debt, foreign agencies.

481 Economics of Environmental Issues 3 Prereq Econ 301 or 302. Economy - environmental interactions; efficient allocation of environmental resources; market failure and environmental degradation; economic analysis of environmental policies.

482 Energy Economics 3 Prereq Econ 301 or 302. Analytical and institutional treatment of energy production and pricing, economic and environmental effects of energy use; U.S. energy policy formulation and Northwest energy issues.

499 Special Problems V V-1-4 May be repeated for credit.

500 Macroeconomic Analysis 3 Prereq Econ 401, 408 or one year calculus or c in Econ 408. General equilibrium theories of inflation and unemployment; consumption, investment, and monetary demand functions; monetary and fiscal policy.

501 Microeconomic Theory 3 Prereq Econ 301 or 302, 408 or one year calculus and c in Econ 408. Static optimization; theory of the consumer and the firm; markets and resource allocation.

502 Advanced Macroeconomic Theory 3 Prereq Econ 500. Mathematical macro general equilibrium and disequilibrium.


504 History of Economic Thought 3 Evoloution of economic theory and thought in historical context; classical and neo-classical contributors, precursors, and critics.

505 Microeconomics for Decision Making 4 Prereq Math 201, 202. For MBA and other master's level students with limited training in microeconomics. The use of economic theory and quantitative analysis for business decisions and policy analysis.

510 Mathematical Models of Economics 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Econ 501 or 503. Exposition of the mathematical structure of economic theories.

511 Econometrics 3 Prereq Ag E 510; Econ 500, 501. Econometric models; review of linear models; introduction to large sample theory; simultaneous equations modelling.

512 Advanced Econometrics 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Econ 502, 503, 511. Large sample theory; nonlinear models; M-estimation, panel data models; nonparametric models; cost and production analysis; transportation, finance, labor, money.

520 Seminar in Monetary Economics 3 Prereq Econ 420, 500. Analysis of money demand models, money supply models, and the role of money in a modern economy.

530 Economic History 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Econ 500, 501, 411. Changes in the American economy; introduction to the new economic history.

530 Economic History 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Econ 500, 501, 411. Changes in the American economy; introduction to the new economic history.

540 Advanced Public Finance 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Econ 503. Positive and normative tax theory; discounting and public investment; externality; decreasing cost industries and public production; public goods.

552 Labor Theory 3 May be repeated for credit; cumulative maximum 6 hours. Development in labor theory; wage theory and recent journals.

560 Seminar in Industrial Organization 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Econ 460. Industrial organization, market conduct, and performance; appraisal of antitrust legislation.

564 Transportation and Urban Economic Analysis 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Econ 501, 411. Advanced freight transportation; cost, production, demand and network analysis; urban transportation models and related issues.


570 International Economics 3 Prereq Econ 470, 501. The basic nonmonetary theory; new theories of international trade; tariffs and commercial policy; effects of economic integration; international movements factor.

571 Monetary Aspects of International Economics 3 Prereq Econ 470, 500. Balance of payments accounting; methods of adjustment to payments imbalance; the foreign exchange market; international financial institutions.

572 Theoretical and Institutional Aspects of Economic Development 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Econ 500. Selected topics in the political economy of developing nations.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Certification Requirements

To be eligible to certify as a major in Economics a student must have earned at least 40 semester hours of credit in graded course work and at least 6 hours of economics core courses, and meet current standards of (1) cumulative g.p.a., and (2) g.p.a. based on at least 9 hours economics core courses. Contact the department for complete details. Current standards are also published each year in the Catalog Supplement.

Schedule of Studies

During the freshman and sophomore years the Econ major should normally begin Econ courses and complete a major portion of the General University Requirements. In the junior and senior year the Econ major may choose from a variety of courses to prepare for employment or postgraduate education. Majors must complete courses in the following areas:

Core: Econ 102 and 203 or 201 (for honor students) and 203; 301 or 302; 401, 402, 430, or 431.

Fields: 18 hours of Econ area courses of which at least 9 hours must be at the 400-level.


Quantitative Methods: (Option A): QMath 215 and Econ 311 or 411; (Option B): Stat 443 and 444.

Related Work: 12 hours from courses outside Econ, typically in Ag Ec, B A, Computer Science, and the Social Sciences (may not be used as GUR courses).
TRANSPORTATION OPTION

The transportation option of the baccalaureate program in economics emphasizes the foundations of economic analysis and decision-making in transportation. The curriculum is useful to students who are considering careers in either the public or private sector of transportation or are planning to do graduate study. The option is designed around a variety of areas to provide the student with skills and training in economic analysis, transportation economics, mathematics, and quantitative methods, and business administration.

General University Requirements

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Arts and Humanities</td>
<td>6</td>
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<tr>
<td>Social Sciences</td>
<td>6</td>
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<tr>
<td>Communication Proficiency</td>
<td>6</td>
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<tr>
<td>Sciences</td>
<td>10</td>
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<tr>
<td>Intercultural Studies</td>
<td>3</td>
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<td>Core Courses</td>
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<tr>
<td>Econ 102, 203</td>
<td>6</td>
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<tr>
<td>Econ 301 or 302</td>
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<td>Econ 320, 401</td>
<td>6</td>
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<td>Econ 430, 431, or 402</td>
<td>3</td>
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<tr>
<td>Field Courses</td>
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<tr>
<td>Upper-division Econ courses with at least 6 hours at the 400-level</td>
<td>12</td>
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<tr>
<td>Transportation Courses</td>
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<tr>
<td>Econ 364 Transport Economics</td>
<td>3</td>
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<tr>
<td>Econ 463 or 464</td>
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<tr>
<td>Mathematics</td>
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<tr>
<td>Math 220 or 201</td>
<td>3</td>
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<tr>
<td>Math 171 or 202</td>
<td>3</td>
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<tr>
<td>Quantitative Methods</td>
<td></td>
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<tr>
<td>QMeth 215 Statistics</td>
<td>4</td>
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<tr>
<td>Econ 311 Econometrics</td>
<td>3</td>
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<tr>
<td>Related Work</td>
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<tr>
<td>12 hours from QMeth 344, C E 322, 424, Accg 230, Mgt 301, Mktg 360, 452, Fin 325</td>
<td>12</td>
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<tr>
<td>Project</td>
<td></td>
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<tr>
<td>Econ 499 (transportation project) or professional internship</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td>38</td>
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</tbody>
</table>

Minor in Economics

A minor in economics is often a desirable complement to majors such as business administration, engineering, education, agricultural economics, forestry, political science, and history. A minor in economics is offered to students who complete 18 hours of economics. Consult the department for an acceptable program of study.

Special Programs of Study

Students planning to begin a career immediately after graduation will find openings in many areas of business and government. Special programs of study for particular areas can be developed with the departmental advisers.

Students planning graduate study, whether in economics, law, business or public administration, are advised to develop skills through courses in English composition and additional work in statistics. Recommendations for specific graduate areas include:

Law School: B Law 210; Accg 230; Pol S 300; and, depending on legal interests, elective Econ courses from the following: Econ 340, 364, 450, 451, 460, 468, 470, 481, 482; B Law 410, 411 suggested.

Business School: Accg 230; Cpt S 105. Additional courses in B A are not required for admission to most graduate schools of business. It might be useful, however, to take a second course in accounting, Accg 231, and to take introductory courses in the major areas of business: B Law 210, Mgt 301, 340, Mktg 360, Fin 325.

Economics: Math 220 and 171 are recommended to satisfy the major's math requirements. Calculus through Math 273 and Econ 408 may also be useful.


After the first two courses students will apply their knowledge of basic economic principles to more specialized subjects: money and banking; business fluctuations; federal, state, and local finance; taxation; labor and collective bargaining, transportation and public utility economics; international trade and finance; government regulation and control of business; economic history; economic theory.

Transfer Students

Students planning to transfer into economics by the end of their sophomore year should have completed the introductory economics courses if they plan to complete the required work for a degree in two additional years.

Preparation for Graduate Study

Students interested in graduate study should have the approximate background of the undergraduate major shown above. However, students with supporting work in related areas may enter into graduate study with somewhat less training in economics. Such students are requested to communicate with the department for advice and assistance in the development of their plans.

Department of Educational Administration and Supervision

Professor and Department Chair, W. H. Omeelch; Professors, J. H. Cooper, J. D. Davis, R. N. Grunewald, R. J. Harder, D. C. Ortich, R. J. Young; Associate Professor, D. B. Reed.

Administrators, teachers, and other educational specialists may undertake graduate studies leading to advanced degrees at the masters or doctoral levels. For the masters and doctoral degrees students may specialize in one of the following areas: administration, community college and higher education, or curriculum and media. The masters degree programs require a minimum of 30 semester credit hours while the doctoral program typically consists of a minimum of 72 semester credit hours. Each area of specialization has a required core of courses. Information on the specific requirements for each degree is available from the Department of Educational Administration and Supervision.

Admission

Admission to the graduate programs in Educational Administration and Supervision will be determined as soon as three letters of recommendation, GRE scores, and all transcripts of past academic work are received and evaluated.

Qualifications of students to continue in the program will be reviewed after the completion of nine hours of graded course work or the first full-time semester or summer session in residence.

Doctoral

Graduate programs are also offered which lead to the Doctor of Education or the Doctor of Philosophy. Programs of study for the doctoral degree must include a common core of required courses plus a major emphasis in one area of specialization. A minor in a second area of specialization is required for the EdD. The following areas of specialization are approved: administration, community college and higher education, and curriculum and media. Each area of specialization requires a specific cluster of courses. The doctoral program may include courses from another department other than the Department of Educational Administration and Supervision or a cluster of supportive courses. Additional information is available from the Department of Educational Administration and Supervision.

Doctoral students will be considered for candidacy after they successfully complete the majority of their course work and pass a written comprehensive examination. A scholarly dissertation is required of all doctoral students.

A thesis is required in each of the doctoral programs. There is a requirement of teaching or related experience for the Doctor of Education. A student pursuing a program leading to the Doctor of Philosophy degree is required to fulfill a research competency requirement since the pursuit of research is emphasized in the program of study for the PhD.

Masters

The Master of Education degree program requires at least 36 semester hours of approved graduate credit. Although a thesis is not required, candidates for the degree usually complete directed study or an individual project.

The Master of Arts in Education degree program is recommended for students who plan to continue work toward the doctoral level. A thesis is required for the degree, and the program and thesis topic are designed to advance the career goals and professional aspirations of the candidate.

Certification

The Department of Educational Administration and Supervision offers certification programs for the initial and continuing certificates for the superintendent, principalship and program administrator. Candidates for administration certification must comply with the following requirements:

1. All candidates for advanced degree or certificate must be formally admitted to the university as specified in the current Graduate Study Bulletin. Admission will be considered after transcripts have been received from the institution which granted the baccalaureate degree as well as from institutions which have granted post-graduate credit.

2. All candidates not holding a master's degree in an appropriate area of specialization must be admitted to the university and the master's degree program in the appropriate department.

3. All candidates for certification must submit the following:
   a. Application for Administrative Certification
   b. Three letters of recommendation
   c. Results of GRE or Miller Analogies Test
4. Admission to the certification is granted only after the WSU Administrative Program Unit reviews the completed application process.

Record of Distinction
The Department of Educational Administration and Supervision sponsors and hosts a number of state, national, and international programs including, the international Educational Administration Abstracts Journal, A. A. Cleveland Conference, Superintendent's Summer Institute, the Rural Education Center, and the Center for Administrative Assessment and Performance. Superintendent certification course work is also offered throughout the state in centers at Spokane, Tri-Cities, Vancouver, South Puget Sound and internationally in the Far East as well as on the WSU campus in Pullman.

Virtually every graduate in Educational Administration and Supervision has found employment, with the vast majority of placements being in the public schools, community colleges or four-year institutions of higher education. The majority of those who have completed the EdM, MA and EdD in administration have been placed in public schools, grades K-12. The majority of those completing the PhD in specializations other than administration have more often accepted appointments to positions in post-secondary institutions.

The College of Education has excellent facilities for graduate study and research. Modern facilities in Cleveland Hall include an instructional media center, a comprehensive Education Library, and Computer Laboratory and Student Computing Facility. Extensive use also is made of the university Computing Center and the university Instructional Media Center. Occasional use is made of the radio and television facilities of KWSU.

Description of Courses
For explanation see Index under "Symbols" Ed Ad

422 Public Administration and Program Management in Developing Countries 3 Same as Ag Ec 422 (CS).

490 Instructional Practicum V 1 (0-3) to 3 (0-9) May be repeated for credit; cumulative maximum 8 hours.

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.

501 Philosophy of Education 3 Development of American educational philosophy.

504 Seminar in the History of Education, 1860 to Present 3 Liberal and revisionist interpretations of the emergence of the present U.S. educational organization and attendant issues.

507 Social Foundations of Education 3 Educa- tional adaptations to the economic and social trends and forces.

510 Improvement of Instruction 3 Prereq teaching experience. Analysis and evaluation of instructional models with emphasis on information processing; implications for changing teaching style.


522 Continuing and Adult Education 3 Development and scope of continuing and adult education; basic concepts of administration, teaching, and curriculum development.

547 Administration of Higher Education 3 Organization, administration, and leadership of universities, colleges, and community colleges.

580 School Organization and Administration 2 or 3 Prereq teaching experience. Readings and discussions on the theories and practices of school organization and administration.

582 Policy Formation in Education 2 or 3 Prereq Ed Ad 580. Political and organizational policy formation processes in educational organizations.

583 Community Relations in Education 2 or 3 Social, political, and economic relationships between education and the community; methods of public polling and campaign strategy techniques.

584 Personnel Relationships in Public Schools 2 or 3 Prereq Ed Ad 580. Human relations in education; problems involved and practical solutions.

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. Joint listing with the University of Idaho (Educ 1DS05).

586 Management of Facility Planning 3 Principles and procedures in the development of educational specifications, conducting needs assessment, forecasting; selecting an architect.

587 Seminar in School Administration V 1-6 May be repeated for credit; cumulative maximum 6 hours. Prereq 6 hrs graduate work in administration. Interdisciplinary seminars related studies; discussions in several areas by specialists.

588 The Law and Education 3 Prereq 6 hrs school administration. Fundamental legal principles within which public education functions; applicable school codes of Washington and other states; review important court cases.

590 Management Development Seminar V 2-3 Improving knowledge and skills in planning systems, decision making, leadership, conflict, motivation, staff development, productivity, and stress.

591 Internals V 3 or 5 May be repeated for credit; cumulative maximum 12 hours. By interview only. Internship in professional positions.

596 Preparing Grant Proposals 3 Identification of funding sources; analysis, evaluation, and production of grant proposals. (SS).

599 Superintendent Institute 2 By interview only. Current concepts and practices in the superintendent's policy, planning, and implementation techniques. (SS)

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Department of Electrical and Computer Engineering

The Department of Electrical and Computer Engineering offers courses of study leading to the degrees of Bachelor of Science in Electrical Engineering, Master of Science in Electrical Engineering, and Doctor of Philosophy. The department offers a schedule of studies in Electrical Engineering and in Computer Engineering, both leading to the degree of Bachelor of Science in Electrical Engineering. The curriculum leading to the Bachelor of Science in Electrical Engineering is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).

The curriculum in Electrical and Computer Engineering is designed to give the student a strong basic knowledge in the areas of general interest to all electrical engineers. The core course of study is therefore oriented toward the basic theory and concepts which prepare one for entry into any of the multitude of activities open to members of the profession—research, development, operations, management, teaching, sales, and consulting. Sufficient laboratory experience is included to provide for familiarity with electrical, electronic, and computing equipment and with experimental techniques. Modern laboratories for electrical circuits, electronics, power systems, electromagnetics, and computers are available. Students are expected to use min-computer, mini-computers, microcomputers, and microprocessor development tools to aid in their studies.

The present curriculum is designed so that the equivalent of the first three semesters may be transferred from the community colleges with minimal faculty or professional courses at the sophomore level, however, are necessary for direct entry into the junior year. 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, thereby allowing the student to develop a breadth of interest or pick an area of specialty. Special programs may be designed for students planning to continue on to advanced study in law, medicine, or business administration, or who wish to pursue undergraduate study in more than one field. Due to limitations of resources, the Department of Electrical and Computer Engineering has been forced to restrict the number of students certified into the program at the junior level. In order for students to be eligible for certification they must have completed E 261 or its equivalent with a grade of "C" or better. The student may apply for certification during the semester of enrollment in E 261 and/or 262. Students should have essentially completed the equivalent of the first two years of the Schedule of Studies in either Electrical or Computer Engineering.

Applications for certification must be submitted prior to November 1 or April 1 for spring or fall semester certification respectively. Eligible students will be ranked in accordance with several criteria including USW and transfer g.p.a., and g.p.a. in mathematics and science, and in electrical engineering courses. Final acceptance will be made after current semester grades are available, and students will be notified of the department's decision as soon as possible.

Cooperative education agreements exist between the College of Engineering and Architecture and certain industries. The student should consult the department chair if interested in the type of program involving part-time attendance in the university and part-time work in industry. Students should be prepared to extend their studies somewhat in order to complete the program. Opportunities for undergraduate study are also provided through the Tri-Cities University Center in Richland, Washington.

Description of Courses

For explanation see Index under "Symbols"

**E 214** Design of Logic Circuits 3 (2-3) Prereq Math 172 or c/c. Functional approach to design of electronic logic circuits; exposure to elementary circuit concepts and design with integrated circuits.

**E 261** Electrical Circuits I 3 Prereq Phys 202; Math 315 or c/c; Cpt S 203 or c/c; c/c in E 262. Fundamental concepts of electrical science and utilization in circuits, components, and devices.

**E 262** Electrical Circuits Laboratory I (0-3) Prereq c/c in E 261. Electrical instruments; laboratory applications of electrical laws; transient and steady-state responses of simple circuits.

**E 300** Technology and Society 3 Technology and its effects on society; demands of society for technology; critical examination of selected technological-societal problems.

**E 304** Introduction to Electrical Circuits 2 Prereq Phys 202; Math 172. Basic d.c. and a.c. circuits.

**E 305** Introduction to Microprocessors 2 Prereq Cpt S 150, 151, or 203. Digital components, circuits, and number representation; microprocessor organization, instruction sets, and system design.

**E 311** Electronics 3 Prereq E 214, 261 with grade of C or better; major or minor in E E. Fundamental digital and linear electronic circuits and devices including large- and small-signal analysis and design.

**E 314** Microprocessor Systems 3 (2-3) Prereq E 214; Cpt S 203 or 150. Comparison of several microprocessor systems with reference to architecture, support software, and electronic characteristics; assembling and programming systems.

**E 321** Electrical Circuits II 3 Prereq E 261 with grade of C or better; major or minor in E E; Math 315. Complex loop and cut-set analysis, state, and Laplace and Fourier transforms, network functions, frequency response, twoports, energy and passivity.


**E 331** Electromagnetic Fields and Waves 3 Prereq Phys 202; Math 315; major or minor in E E. Fundamental of electrical fields, magnetic fields, and electromagnetic waves.

**E 341** Communications Systems 3 Prereq E 321. Feedback, probability, analog modulation, receiver performance in noise, pulse modulation, filters.

**E 351** Distributed Parameter Systems 3 Prereq E 331. Transmission lines, high frequency electronics, antennas, telecommunication theory.

**E 352** E E Laboratory I 3 (1-6) Prereq E E 311, 321, or c/c; Cpt S 150 or 151 or 203, major in E E. Experiments in electrical circuits, measurements and electronics; principles of measurement and measuring instruments.

**E 361** Electrical Power Systems I 3 Prereq E 321, 331. Power system hardware; transformers, machines, power electronics and transmission lines; power systems analysis: load flow, transient, and stability.

**E 370** Power Systems Laboratory I 2 (0-6) Prereq c/c in E E 361. Experiments in simulation, modeling, transformers, rotating machines, and transmission lines.

**E 395** Internship in Electrical Industry I 1-4 May be repeated for credit; cumulative maximum 6 hours. For sophomores and juniors in E E. Students work full time in engineering assignments in approved industries.

**E 414** Fundamentals of Digital Systems 3 Prereq E E 214 and Cpt S 260; or E E 314; major in E E. Boolean algebra; minimization of Boolean functions; realization of combinational and sequential logic circuits; digital system organization and design.

**E 416** Electrical Engineering Design Precepts 3 (1-6) Prereq senior in Engr. By interview only. Electrical design procedures for specific open ended design projects: proposals, specifications, codes, cost, documents, and oral presentations.


**E 431** UHF and Microwave Circuits 3 or 4 (3-3) Prereq E E 351. Transmission lines and waveguides in the time and frequency domain, passive and active distributed parameter circuits.

**E 434** VLSI Systems I 3 (2-3) Prereq E E 311, 414 or c/c; c/c in E E 466 or c/c. Design of digital systems for VLSI fabrication; use of computer design aids.

**E 441** Digital Control Systems 3 Prereq E E 489. Data conversion and sampling, sample-data control systems, digital control systems analysis, computer aided design and simulation, microprocessor control.

**E 422** Robotics 3 Prereq E E 489 or M E 481 or c/c. Robots; transformation, kinematics, inverse kinematics, Jacobians, dynamics, sensors, actuators, position control, force control, hybrid control, trajectory generation.

**E 444** VLSI System II 1 (0-3) Prereq E E 434. Testing theories; test generation; laboratory experience with test hardware and software; design of tests.


**E 464** Digital Signal Processing 3 Prereq E E 341. Discrete and fast Fourier transforms; discrete convolution; sampling theorem; digital filtering; pulse transmission; effects of quantization and round-off.

Joint listing with the University of Idaho (EE ID50).

506 Estimation and Identification 3 Prereq E E 450. Least-squares estimation; Wiener-Hopf equations; innovations processes; Wiener, Levinson, Kalman filters, stochastic realization theory; recursive algorithms and maximum likelihood identification algorithms. Joint listing with the University of Idaho (EE ID571).

509 Adaptive Control 3 Prereq 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 3 Prereq E E 491 or c/. Protection of electrical equipment as related to electric power systems. Joint listing with the University of Idaho (EE ID526).

516 Microwave and Optical Communication Systems 3 Prereq E E 351. Electromagnetic propagation in inhomogeneous and anisotropic media and modes; dispersion; terrestrial microwave, satellite, microwave and optical fiber communications. (a/y)

517 Electrical, Magnetic, Optical, and Conductive Properties of Solids 3 Prereq one semester therm. Macroscopic properties and measurements; magnetic, dielectric, and optical properties; magnetostriiction; thermo-optical effects; magnetostriction; and magnetostriction effects.

518 Advanced Electromagnetic Theory I 3 Prereq E E 351. Field theory, classical electromagnetism, potential theory, boundary value problems, wave propagation.

519 Advanced Electromagnetic Theory II 3 Guided waves, inhomogeneous wave equation, radiation, scattering, diffraction.


522 High Voltage Engineering 3 High voltage-high power phenomena; design and measurements associated with electrical transmission, current interruption, insulation, transformation, lightning, and corona.

524 Advanced Digital System Architecture 3 Prereq E E 424. Parallel and distributed processor; multiprocessor; interconnection topology; language directed architecture; special purpose architecture.

527 Antenna Theory and Design 3 Prereq E E 351. Antenna fundamentals, analytical techniques, characteristics and design procedures for selected types of wire, broadband, and aperture antennas. (a/y)

531 Energy Management and Planning 2 Concepts of energy management and planning; forecasting, resource assessment and impact studies.

534 High Performance Computing 3 Prereq E E 414. Development, current state and future of high speed computing; application of existing commercial supercomputers to engineering problems. Cooperative course taught at the University of Idaho (EE ID504).

535 Data Communication Networks 3 Prereq E E 507. Packet switching networks; local area networks; polled and random access systems; routing; flow control; capacity assignments; statistical multiplexing systems; application.


555 Digital Image Processing 3 Same as Cpt S 445.

474 Digital Image Processing 3 Same as Cpt S 445.

475 Electrical Measurements and Transducers 3 (1-6) Prereq E E 352. Principles of electrical measurements and techniques with individual transducer design, development and test problem; formal report.

476 Electronics Circuits I 3 Prereq E E 311; 351 or c/; 489 or c/; c/ in 477. Circuits with active elements; design of amplifiers, oscillators, and other circuits using semiconductor devices.

477 Electronics Laboratory 2 (1-3) Prereq c/ in E E 476. Laboratory applications of E E 476.

486 Power Electronics 3 Prereq E E 311, 314, 361. High power electronics devices; theory, limitations, and applications; analysis and design of sources, motor controllers, and switching circuits. Joint listing with the University of Idaho (EE ID525).

489 Introduction to Control Systems 3 Prereq E E 321. Analysis, synthesis, stabilization, and optimization of closed-loop systems.

491 Performance of Power Systems 3 Prereq E E 341, 361. Static and dynamic behavior of power systems, fault studies, surge phenomena and economics.

492 Protection of Power Systems 3 Analysis and equipment fundamentals of power system protection; symmetrical components, relays, fuses and circuit breakers with burden and fault calculations.

494 Computer Modeling of Dynamic Systems 3 (2-3) Prereq E E 489 or c/. Analog and digital computer simulation of systems in engineering, mathematics, and other selected disciplines.

496 Internship in Electrical Industry II V 1-4 May be repeated for credit; cumulative maximum 8 hours. Prereq E E 341 or 361. For juniors and seniors in E E. Students work full time in engineering assignments in approved industries.

496 Introduction to Semiconductor Device Theory 3 Prereq MSE 302 or E E 311. Equilibrium statistics of electrons and holes; carrier dynamics; p-n junctions, metal-semiconductor junctions, BJT, MOSFET, LED.

499 Special Problems V 1-4 May be repeated for credit.

501 Linear System Theory 3 Prereq E E 489. Dynamic systems from the state variable approach; observability, controllability, stability, and sensitivity of differential and non-differential systems. Joint listing with the University of Idaho (EE ID572).


503 Large-Scale Dynamic Systems 3 Prereq E E 501. Lyapunov stability and input-output stability of large-scale systems, decentralized control, uncertainty, robust decentralized servomechanism, singular perturbation methods and multiple-time scale.

504 Applied Optics 3 Prereq E E 341, 351. Scalar diffraction theory, lenses, spatial filtering and optical information processing, holography. (a/y)


564 Advanced Signal Processing 3 Prereq E E 507 or c/. Signal processing and communication theory aspects of frequency domain analysis of continuous and discrete random signals.

581 Advanced Topics in Power Engineering V 1-3 May be repeated for credit.

582 Advanced Topics in System and Circuit Theory V 1-3 May be repeated for credit.

586 VLSI Systems Design 3 Prereq E E 444. VLSI models, layout algorithms, design methodologies, simulation and layout tools, algorithm design for VLSI implementation.

594 Advanced Topics in Electronic Materials 3 Prereq E E 486. Growth and properties of gallium arsenide, indium phosphide, and cadmium telluride; LPE, VPE, OMVPE, and MBE.

595 Directed Study in Electrical Engineering V 1-3 May be repeated for credit. Current topics in electrical engineering. Cooperative course taught at the University of Idaho (EE ID502).

596 MOS Integrated Circuits 3 Prereq E E 496. MOSFET device physics; analysis and design of analog and digital integrated circuits, operational amplifiers, A/D, D/A, ROM, and RAM.

597 Integrated Circuits Laboratory 4 (2-6) Prereq E E 496. Theoretical analysis of the fundamentals of process technologies; fabrication and testing of diode and MOS integrated circuits.

598 Microwave Semiconductor Devices 3 Prereq E E 496. High electron mobility transistors (HEMT). GaAs MESFET; transistor devices (IMPATT, BARITT) and Gunn diodes.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Schedule of Studies

A Bachelor of Science degree in Electrical Engineering ordinarily requires a total of 128 hours. At least 48 of the total hours must be in upper-division courses. Students in the program may elect to pursue the schedule of studies in either Electrical Engineering or Computer Engineering.

**ELECTRICAL ENGINEERING**

**Freshman Year**

**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cpt S 151 FORTRAN¹</td>
<td>2</td>
</tr>
<tr>
<td>Engl 101 [W] Composition (GUR)</td>
<td>3</td>
</tr>
<tr>
<td>Chem 105 Principles</td>
<td>4</td>
</tr>
<tr>
<td>Math 171 Anal Geom Calc</td>
<td>4</td>
</tr>
<tr>
<td>Soc 5 Elective [S] (GUR)</td>
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**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Approved Elective²</td>
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</tr>
<tr>
<td>Phys 201 Engineering</td>
<td>4</td>
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<tr>
<td>Math 172 Anal Geom Calc</td>
<td>4</td>
</tr>
<tr>
<td>Math 220 Int Linear Alg</td>
<td>2</td>
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<tr>
<td>Hum Elective [H] (GUR)</td>
<td>3</td>
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</table>

**Sophomore Year**

**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>E E 214 Log Ckts</td>
<td>3</td>
</tr>
<tr>
<td>Math 273 Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>Phys 202 Engineering</td>
<td>4</td>
</tr>
<tr>
<td>C E 213 Stat Mech Mat</td>
<td>4</td>
</tr>
<tr>
<td>MSE 302 Materials Science</td>
<td>3</td>
</tr>
</tbody>
</table>
Department of Elementary and Secondary Education

Second Semester
- E E 261 Electrical Ckts I 3
- E E 262 Electrical Ckts Lab 1
- E E 314 Microprocessor Syst 3
- C E 214 Intro Dynamics 2
- Math 315 Diff Equations 3
- Economics [S] (GUR) 3

Junior Year
First Semester
- E E 311 Electronics 3
- E E 321 Electrical Circuits II 3
- E E 331 Flds & Waves 3
- E E 352 E E Lab I 3
- Econ 201 [S] Contemporary (GUR) 4

Second Semester
- E E 341 Communications Syst 3
- E E 351 Dist Parameter Syst 3
- E E 361 Electrical Power Syst 3
- E E 362 Power System Lab I 3
- Engl 402 W Pro Tec Wtr (GUR) 3
- Stat 443 Applied Probability 3

Senior Year
First Semester
- E E 414 Fund Digital Syst 3
- E E 434 VLSI Design I 3
- E E 466 Pulse & Digital Ckts 3
- Intercultural Studies (GUR) 3
- Approved Technical Elective 5

Second Semester
- E E 424 Digital Syst Arch 4
- E E 444 VLSI Design II 3
- Soc S [S] or Hum H [GUR] 3
- Adv Hum [H] or Soc S [S] (GUR) 3
- Approved Technical Elective 6

At least one senior elective must be chosen from the 400-level E E courses, and at least one senior elective must be chosen from the 300- or 400-level computer science courses. Any remaining two electives may be chosen from either department. The student must select electives with an advisor’s approval.

Transfer Students

Students planning to transfer from other institutions should carefully note the sequence of courses listed above. Transfers from community colleges should consult the booklet "Transfer Programs for Washington Community Colleges" or should write directly to this department for specific information.

Preparation for Graduate Study

Before undertaking graduate study in electrical engineering, a student should have completed substantially the equivalent of one of the above schedules of studies. Undergraduate students who qualify for graduate school should be invited to participate in a combined 5-year BS/MS program. For students entering from other areas, completion of necessary prerequisite courses may be undertaken while enrolled as a graduate student.

Department of Elementary and Secondary Education

Professor and Department Chair, T. P. Ruft; Professors, C. S. Johnson, J. Kornack-Kelly, M. S. Lilly, D. B. McLeod, J. L. Milligan; Associate Professors, G. W. Boyko, G. H. Maring, D. McCullough, J. M. Mignogna, J. K. Miller, M. M. Oakes; Assistant Professors, S. E. Deutschman, R. P. Gebhardt, S. C. Vaughan.

The Department of Elementary and Secondary Education is accredited by the National Council for Accreditation of Teacher Education (NCATE) and prepares teachers, school administrators, and other specialists for schools and colleges.

The teacher-education program includes a core of liberal arts courses, professional education and methodology courses, subject area courses and supervised field experiences, including an extended school internship. Students are assigned to faculty advisers who consult and assist them in planning programs which meet the individual’s goals and professional objectives.

The department offers courses of study leading to the degrees of Bachelor of Arts in Education, Bachelor of Science in Agricultural Education, Master of Arts in Education, Master of Education, Doctor of Education, and Doctor of Philosophy.

Admission

The Department of Elementary and Secondary Education requires prospective students to meet initial screening requirements before they are admitted to the department. Applicants must show proficiency in the basic skills, including reading, writing, mathematics, and oral competency:
1. Successful standardized test scores on the SAT, ACT, or Washington Pre-College Test;
2. Cumulative g.p.a. of at least 2.5 over 30 semester hours of course work;
3. Grade of C or better in English 201 or an equivalent sophomore composition course;

Students attempting to enter the program with low test scores will be provided an opportunity to take the Test for Entrance into Teacher Education Programs. Those not meeting minimum test scores must certify competence in reading and mathematics by achieving a grade of C in specified coursework.

Admission or continuing enrollment may be denied an education major on the basis of review by the department. Applicants for the Initial Certificate who have a bachelor’s degree from an accredited institution other than Washington State University must complete the teacher-education program and earn not less than 30 semester hours in residence. They shall apply for admission to the university to work toward a teaching certificate, usually as a Class 5 in the Graduate School. Applicants who have had one or more years of experience as teachers and who wish to work for a Continuing Certificate shall apply for admission to the Graduate School as a Class 5. Those who wish to prepare for supervisory or administrative positions in the schools shall apply for admission to the Graduate School to pursue the particular program.

Preparation for Teaching Certificates

Initial Certificates—Four-Year Program

Under the authority of the bylaws of the state of Washington and the regulations of the State Board of Education, Washington State University grants an Initial Certificate to all candidates who meet the United States citizenship requirements of Washington certification, who have the personal qualifications to teach, and who meet the specified requirements. The certificate is valid for four years. The initial certificate will be limited by the university as to grade level and subject matter, and may be renewed for a period of three years thereafter to teach in the public schools of the state.

Students in agricultural education and home economics education are referred to the Adult and Youth Education section of this bulletin for their certification requirements.

Application for issuance of an Initial Certificate should be submitted to the Department of Elementary and Secondary Education within six months of the completion of the student’s senior year.
Continuing Certificate and the Fifth Year of Preparation

Experienced teachers may be recommended by Washington State University to the State Superintendent of Public Instruction for the Continuing Certificate. Candidates for the certificate shall meet the following requirements dependent upon their present certificate status. The Continuing Certificate is valid as long as the individual remains in the teaching profession and for a period of seven years thereafter.

Holders of the Initial Certificate may be recommended for a Continuing Certificate upon completion of three years of successful teaching experience and an approved fifth-year college program of studies (30 semester hours). The fifth year of study, which should be planned with the recommending institution, provides an opportunity for specialization and to strengthen teaching competence. General regulations for the fifth year of study, which may be completed in summer sessions or in an academic year, may be secured from the College of Education Certification Office.

ESA Reading Resource Specialists

The Department of Elementary and Secondary Education at Washington State University in association with the Eastern Washington Reading Resource Specialist Consortium has an approved program for the preparation of Reading Resource Specialists. This program requires that the applicant complete a master's degree and pass competency review which is conducted by the consortium. Further information may be obtained from the Department of Elementary and Secondary Education.

University Reading/Study Skills Services

El/Se 100 is a half-semester course offered through the Department of Elementary and Secondary Education and offers students assistance in such areas as note taking, study habit/time management, study reading, test taking, comprehension development, vocabulary, and the use of university libraries. Interested students can get further information by contacting the department office in Cleveland 252.

Transfer Students

Education majors are required to complete in residence at least one-half of the total hours required in professional education for the Initial Certificate.

Course of Study

The State Board of Education has established guidelines and standards for teacher-preparation programs. All Initial Certificates recommended by the Department of Elementary and Secondary Education of Washington State University meet these standards.

The Initial Certificate is limited to grade level and subject-matter preparation for the first four years of teaching. Each student will prepare to teach at one of three levels: elementary school, senior high school, or K-12 and plan a program in accordance with the requirements of the preferred level. Those who wish to be certified to teach at more than one of the three levels should plan their programs with an education adviser as they will be expected to complete more than the minimum requirements listed below for any one level of preparation.

The following professional laboratory experiences are provided:

1. El/Se 300 is required and is a prerequisite to Directed Teaching. The student participates in daily activities during a week practicum in a public school (usually in January) and attends orientation lectures. Arrangements are made for this experience with the Director of Teacher Education.

2. In El/Se 303, 305, and 320 all students participate in required directed observations in public school classrooms one-half day per week. Special Education majors are required to participate in six hours per week of practicum in a Special Education classroom in a public school in conjunction with both Sp Ed 401 and 402.

3. El/Se 405 or 406 Directed Teaching consists of approximately nine to sixteen weeks of full-time participation in the teaching program of a public school. Students must be certified in the Department of Elementary and Secondary Education prior to student teaching. Classroom assignments are made by the Office of Student Teaching and are contingent on a 2.00 minimum g.p.a. in all of the following areas:
   a. Cumulative academic record
   b. Professional education record
   c. Academic major and minor

REQUIREMENTS FOR THE INITIAL CERTIFICATE

Elementary School Preparation

1. General Education and General University Requirements for Graduation: 28 hours. 6 hours of communication proficiency; 6 hours of arts and humanities; 6 hours of social sciences including Psychology 102; 10 hours of science including one credit in laboratory and including Math 200 and 300.

2. Professional Education and Professionalized Subject-Matter Minor: 45 hours

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EL/SE 300 Intro Field Trip</td>
<td>1</td>
</tr>
<tr>
<td>EdPsy 301 Edu Psych</td>
<td>4</td>
</tr>
<tr>
<td>EL/SE 304 EL SS Sci Math</td>
<td>3</td>
</tr>
<tr>
<td>EL/SE 305 EL SS Sci Math</td>
<td>3</td>
</tr>
<tr>
<td>EL/SE 306 EL Rdng and LA</td>
<td>4</td>
</tr>
<tr>
<td>EL/SE 307 Sur Chl Lit</td>
<td>3</td>
</tr>
<tr>
<td>EL/SE 320 EL Read Meth</td>
<td>3</td>
</tr>
<tr>
<td>EL/SE 390 Elem Art Ed</td>
<td>2</td>
</tr>
<tr>
<td>EL/SE 401 Eval Lang El</td>
<td>2</td>
</tr>
<tr>
<td>EL/SE 403 or 404 Curriculm</td>
<td>3</td>
</tr>
<tr>
<td>EL/SE 405 or 406 Dir Teaching</td>
<td>10</td>
</tr>
<tr>
<td>H Ed 480 or 481 Sch Hh Prg</td>
<td>3</td>
</tr>
<tr>
<td>Mus 388 Mus for Tchr</td>
<td>2</td>
</tr>
<tr>
<td>PEP 472 or 473 K-3 or 4-8</td>
<td>3</td>
</tr>
</tbody>
</table>

3. Degree: Those who are preparing to become elementary teachers will be granted a Bachelor of Arts degree in Education provided they meet the General University Requirements for Graduation and the program for elementary school preparation as determined by the department. They will certify their majors in education as soon as possible after earning 30 hours of credit but before they enroll in any education courses. They will then be assigned an adviser in the Department of Elementary and Secondary Education.

4. Required professionalized subject-matter minor courses.

High School Preparation

1. General Education: approximately 45 hours including H Ed 480 or 481; Psych 105; and courses used to meet the General University Requirements for Graduation for the bachelor's degree (see item 4 below).

2. Professional Education: 26 hours

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EL/SE 300 Intro Field Exp</td>
<td>1</td>
</tr>
<tr>
<td>EdPsy 301 Edu Psych</td>
<td>4</td>
</tr>
<tr>
<td>EL/SE 303 Teach Sec School</td>
<td>4</td>
</tr>
<tr>
<td>CoPsy 358 or 359 Curr Issues</td>
<td>2</td>
</tr>
<tr>
<td>EL/SE 402 Eval Lang Sec</td>
<td>2</td>
</tr>
<tr>
<td>EL/SE 403 or 404 Curriculm</td>
<td>3</td>
</tr>
<tr>
<td>EL/SE 405 or 406 Dir Teaching</td>
<td>10</td>
</tr>
<tr>
<td>EL/SE 450/451 Tch Rdng Cnt Arts</td>
<td>2-3</td>
</tr>
</tbody>
</table>

3. Subject-Matter Preparation: approximately 48 hours. The student will select a teaching major of approximately 30 hours and a teaching minor of approximately 15-21 hours from the high school majors and minors listed in this section of the catalog. In a few specific fields, 45-hour majors are indicated and no minor is required.

4. Degree: Students preparing to become senior high school teachers will secure their degrees in one of the subject-matter departments of the university or in General Studies. They will certify as a double major in both the degree department and the Department of Elementary and Secondary Education before they take any education courses. They will have advisers in both departments.

Description of Courses

For explanation see Index under "Symbols"

El/Se 100/101 Reading Efficiency and Study Skills 1 Strategies to augment such student capabilities as vocabulary, comprehension rate flexibility, note-taking, test-taking, and study skills.

300 Introductory Field Experience 1 (0-3) Supervised field experience for preservice teachers designated as an orientation to education and the opening of school.

303 Teaching in Secondary Schools 4 (3-3) Prereq El/Se 300, EdPsy 301. Materials and general methods for teachers; observation to be scheduled in a 3-hour block once a week.

Elementary Mathematics, Science, Social Studies 1 3 Prereq El/Se 300, EdPsy 301, Math 300 or c/c. Scope and sequence of content in elementary and middle school science, social studies, and mathematics.

Elementary Mathematics, Science, Social Studies 1 3 Prereq El/Se 300, EdPsy 301, Math 300 or c/c. Scope and sequence of content in elementary and middle school science, social studies, and mathematics.

Survey of Elementary Reading and Language Arts 4 Prereq El/Se 301. An introductory survey course focusing on the attitudes, knowledge, and skills needed for successful teaching of reading and language arts.

Survey of Children's Literature 3 Prereq EdPsy 301. Types, values, selection of children's literature; role of teacher in facilitating children's experiences with books.

Teaching Writing in the Elementary Schools 2 Prereq EdPsy 301 or c/c. For preservice elementary teachers. Improving writing skills; preparing effective writing lessons.
311 Teaching Elementary Physical Sciences 3 (2-3) Prereq: EdPsy 301; Math 200. Science teaching techniques, processes, and materials appropriate for selected physical sciences.

312 Teaching Elementary Physical Sciences II 3 (2-3) Prereq: EdPsy 301; Math 200. Science teaching techniques, processes, and materials appropriate for selected physical sciences.


335 Bilingual-Bicultural Education 3 Same as Ch St 335.

389 Art Media for Schools 3 (0-6) Same as F A 389.

390 Elementary School Art Education 2 (1-3) Prereq EdPsy 301. Creative methods for utilizing art media in the elementary classroom.

403/404 Social Foundations of Curriculum 3 Prereq: Ed/Se 303 or 320; c/o in directed teaching. Public school curriculum.

405/406 Directed Teaching V 8 (1-2) to 8 (1-33) May be repeated for credit. Prereq: Ed/Se 303 or 305, and 300, 320; senior standing. By invitation only. Supervised teaching in public school (full pay for one-half semester). Includes a 2-hour weekly seminar in problems of teaching.

411 Bilingual Methods and Materials Across Content Area 3 Prereq: Ed/Se or Ch St 335. Approaches, methods, and materials across content areas for the bilingual classroom.

430/431 Innovations In Reading 2 Prereq: Ed/Se 320 or 450/451. Aspects of reading beyond basic methods course; individual diagnosis; current programs and trends; activities and materials for enrichment. Credit not granted for both Ed/Se 430/431 and 530/531.

443/443 Children's Literature in the Curriculum 2 Prereq: Ed/Se 305, 320 or teaching experience. Role, models, utilization of trade books and story-telling in language experience and individualized reading, content areas and creative expression. Credit not granted for both Ed/Se 443/443 and 532/533.

445/446 Preparation and Utilization of Audio-Visual Materials V 2 (1-3) or 3 (2-3) Prereq 6 hrs Edu. Sources and evaluation of materials; practice in techniques with materials and equipment.

447 Designing Personalized Instructional Materials 2 (1-3) or 3 (2-3) Prereq 6 hrs Edu. Relating all media to the instructional process; development and production of learning activities package, television lesson, and basic photography project.

450/451 Teaching Reading in Middle and Secondary Schools 2 or 3 Prereq EdPsy 301. Theory and practice of teaching content area, developmental and remedial reading; staff development and practical applications, grades 6-12.

452 Content Area Reading and Study Skills Practicum V 1-3 May be repeated for credit; cumulative maximum 9 hours. Prereq: Ed/Se 320 or 450. Development and delivery of vocabulary, comprehension, and study skills.

455 Educational Uses of Microcomputers V 2-3 Prereq Ed/Se 303 or 304. Types and functions of educational software, evaluation criteria, designing instructional programs and classroom considerations.

462/463 Corrective Reading in the Classroom 2 Prereq: Ed/Se 320. Investigation, formulation, application of the psychological and physical assessment for classroom grouping and instruction; specific skill needs of learning-disabled readers.

486/486 Social Studies in the Contemporary School 2 Prereq junior standing. Bases, scope, and sequence of the social studies curriculum; problem analysis of timely issues.

490 Instruction Practice V 1 (0-3) to 3 (0-9) May be repeated for credit; cumulative maximum 9 hours.

491 Education and Social Change in Africa 3 Same as BI 311.

492 Designing Art Programs for the Public Schools 3 Prereq: Ed/Se 390, secondary art major, or teaching experience. Preparation of preservice and in-service educators in the development of arts programs (K-12) responsive to current needs and trends.

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.

511 Teaching Poetry to Children and Young People 3 Prereq Ed/Se 303 or 307 or teaching experience. Elements and forms of poetry for children and young people; selection and utilization in the school curriculum. (a/y)

513 Seminar in Middle School Education 3 Prereq teaching experience. Curriculum patterns and recent research regarding instruction and materials in the contemporary middle school.

519 Practicum in Teaching and Education 1 May be repeated for credit; cumulative maximum 4 hours. Problems and issues encountered in college teaching.

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.

523 Content Area Reading Instruction: Theory and Practice 3 For teachers, supervisors, and administrators in elementary, middle, and secondary schools; influence of research on the design of reading strategies. (SS)

527 Psycholinguistics for Reading Centers 3 Use of reading/learning centers in the common schools (K-12); design of reading activities from psycholinguistic research perspectives. (SS)

530 Innovations in Reading 2 Graduate level counterpart of Ed/Se 430; additional requirements. Credit not granted for both Ed/Se 430 and 530.

531 Innovations in Reading 2 Same as Ed/Se 530. Graduate level counterpart of Ed/Se 431; additional requirements. Credit not granted for both Ed/Se 430 and 531.

532 Children's Literature in the Curriculum 2 Graduate level counterpart of Ed/Se 432; additional requirements. Credit not granted for both Ed/Se 430 and 532.

533 Children's Literature in the Curriculum 2 Same as Ed/Se 532. Graduate level counterpart of Ed/Se 433; additional requirements. Credit not granted for both Ed/Se 430 and 533.

539 Innovations in Language Arts 3 Prereq Ed/Se 303 or 320 or teaching experience. The most recent developments in language arts instruction for pre-service and in-service teachers K-12.

540 Elementary School Social Studies 3 Prereq teaching experience. Elementary structures of various social sciences; research findings related to instruction; classroom applications and materials.

541 Elementary School Science 3 Prereq Ed/Se 305; teaching experience. Theories and research underlying modern science programs with classroom implications. (a/y)

542 Elementary School Mathematics 3 Prereq Ed/Se 305; Math 200; teaching experience. Classroom experiences and materials for helping children understand number properties and operations; research findings related in instruction.

544 Advanced Children's Literature 3 Prereq Ed/Se 307; teaching experience. Trends, issues, and research in children's literature.

545 Teaching Oral Language Skills in the Elementary School 3 Prereq teaching experience. Research on children's oral language development; application to elementary school classroom. (a/y)

546 Teaching Written Expression in Elementary School 3 Prereq teaching experience. Research on children's written language development; application to elementary school classroom.

547 Teaching Folk Literature to Children and Adolescents 3 Prereq Ed/Se 307 or teaching experience. Folk literature as a genre in child and adolescent literature; curriculum applications; reading, language development, social studies, creative expression. (SS)

550 Research in Reading 2 or 3 Prereq Ed/Se 320; teaching experience. Research applied to pertinent classroom problems in the teaching of reading.

551 Psychology of Reading 2 Prereq Ed/Se 320 or 450/451; teaching experience. Psychological, perceptual, motivational, developmental and physiological aspects of reading. (a/y)

552 College Reading Practicum V 1 (0-3) to 3 (0-9) May be repeated for credit; cumulative maximum 3 hours. Prereq: Ed/Se 320 or 450/451; teaching experience. Clinical practice; teaching reading skills to college students; programs, materials, techniques, and readings; applicable secondary and college reading programs.

553 Diagnosis and Treatment of Reading Disability 4 (3-3) Prereq: Ed/Se 320. Remedial techniques for experienced teachers, remedial reading teachers, and reading consultants; causes of disability, testing, diagnosis, and remediation; tutoring.

554 Approaches to Reading Instruction 3 Prereq Ed/Se 320 or teaching experience. Approaches to teaching elementary school reading; theoretical bases, materials; evaluation, implementation strategies. (SS)

560 Internship V 3 or 6 May be repeated for credit; cumulative maximum 12 hours. By interview only. Internship in professional positions.

569 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Schedule of Studies

Students planning to complete a program in education must follow the requirements for the initial Certificate for the appropriate level, elementary,
middle school, or high school preparation, are listed in this section of the catalog and the schedule of studies of their degree department. General University Requirements including Psych 105 should be completed during the freshman and sophomore years. At least 40 of the total hours required for the bachelor's degree in this program (elementary school majors only) must be in upperdivision courses.

The student's schedule should be planned so that directed teaching may be taken either the first or second semester of the junior year in either half of the semester. With the special approval of the Chair of the Department of Elementary and Secondary Education, the directed teaching semester may be taken during the second semester of the junior year. Written application for directed teaching must be made by mid-December for the school year preceding enrollment in EI/Se 405 or 406.

Preparation for Graduate Study
As preparation for work toward an advanced degree in teacher education, a student should have completed an acceptable teacher-education program.

Subject-Matter Requirements for Majors and Minors

Agricultural Education
Senior High School Major:
Teachers qualifying to teach agriculture have the choice of selecting from four options: (1) production agriculture-mechanics, (2) production agriculture-business, (3) agricultural resources-forestry, and (4) horticulture. Forty-five hours in agricultural sciences are needed with specific courses required depending upon the option selected. See Agricultural Education program listed under the Department of Adult and Youth Education. Agriculture majors should consult with an adviser in Agricultural Education as the professional education requirements for a teaching certificate differ from the program for other education majors. When all requirements for graduation are completed, the student will qualify for a Bachelor of Science degree in Agriculture.

Bilingual-Bicultural Education (Spanish-English)
Bilingual Methodology: EI/Se 335, 411, plus two blocks of student teaching (EI/Se 405 and 406). One block of student teaching will be conducted in a bilingual-bicultural classroom. Culture and History: Ch St 220, 227, 323, 375, 377. Language and Linguistics: Ch St 329. Candidates must pass a Spanish language proficiency examination before teacher certification.

Biological Science
Senior High School Major: 35 hours including Bio S 103, 104, 372, 430, GenCB 301, BC/BP 364, Bot/Zool 405, Bot/GenCB/Zool 450, and 8 elective hours of biological sciences from bacteriology, botany, genetics and cell biology, and zoology.

Senior High School Minor: 20 hours
A course in introductory biology, GenCB 301, Bio S 372, 430, and additional hours from bacteriology, botany, genetics and cell biology, and zoology, to include one course in physiology.

Chemistry
Senior High School Major: 30 hours
Chem 105, 106, and 107, or 115, 116, and 117; 220 and 222; Hist 381 or 382, plus additional hours from 300- and 400-level chemistry courses. Required Minor: Bio S 430; at least 15 hours of mathematics and physics including either Phys 101, 102, or 201, and Math 108. If additional courses are taken to satisfy the departmental requirements, the degree should be taken in chemistry. If not, it should be in General Studies.

Senior High School Minor: 18 hours
Bio S 430; at least 15 hours in chemistry courses from the courses listed under the major.

Child Studies

Communications
Senior High School Major: 36 hours
(An approved teaching minor is required with this major.)
Journalism: Students will be certified as majors if they earn a 2.7 g.p.a. in the following core courses and have a 2.5 cumulative g.p.a.: Com 225, and two of Com 101, 245, or 270. Upon certification, these requirements will be met: Pre-professional: 9 hours -- Jour 305, 330, and 425, Issues/Institutions/Organizations: 6 hours -- Com 415 plus one of the following: Com 410, 420, 430 or 450. Theory: 6 hours -- Jour 475 plus one of the following: Com 373, 460, 470, or 490. Enrichment: 6 hours -- Com 253, Jour 395, 430 or 495, or six upper-division hours in mass communications sequence.
General Communications: Students will be certified as majors if they complete the core courses listed under journalism above and have the 2.7 and 2.5 grade point averages. Students must obtain approval of a course of study in 27 hours in the professional, issues/institutions/organizations, theory, and enrichment categories by filing a program with the Communications Chairperson and the coordinator of Student Personnel Services in the Department of Elementary and Secondary Education.
In addition to meeting these departmental requirements students seeking a BA in Communications will meet the graduation requirements of the College of Sciences and Arts and complete a minimum of 81 hours outside the Department of Communications.

Speech Communication: Students will be certified as majors if they have a 2.5 cumulative g.p.a. and earn a 2.7 g.p.a. in the following core courses: Com 225 and two of Com 101, 245, or 270. Upon certification, these requirements will be met: SpCom 101 or 301; SpCom 102 or 302; 235; 251; 330 or 331; two courses from SpCom 401, 405, 415, 425; SpCom 435; Spe 260, 361.

Senior High School Minor: 18 hours
Students must complete the courses listed for one of the following sequences plus additional work in Communications to total 18 hours.

Advertising: Com 225, Adver 280, 380, 381; Broadcasting: Com 225, Bdcst 255, 365 or 355, and 475; Journalism: Com 225, Jour 305, 330, 425, Com 410 and 415; Public Relations: Com 225, Jour 305, P R 312, 313, 413. Elective courses are to be approved with an adviser in the Department of Communications. Speech Communication: SpCom 251 or 351, 435; one course from SpCom 101, 235, 301, 405; 102 or 302; 330 or 331; Com 245, Spe 260, 361 are recommended.

English
(An approved teaching minor is required with this major.)
Senior High School Major: 38 hours
Engl 201, 208, 323, 400. At least three of the following: Engl 108, 209, 210, 245, 246. Two of the following: Engl 304, 305 or 306, 307, 407, 415. At least one course from each of the following groups: (1) Engl 322, 333, 334; (2) Engl 366, 367, 416, 417; (3) Engl 316, 320, 360, 369, 471, 472; (4) Engl 255, 256, 354, 458. If the above requirements plus the requirements for graduation of the College of Sciences and Arts are met, the degree will be Bachelor of Arts in English.

Senior High School Minor: 18 hours
Engl 209, 210; 245 or 246; 255; 301, plus 3 additional hours from courses numbered above 300.

Fine Arts
Major: 53 hours
F A 101, 103, 110, 111, 201, 202, 304, 320, 331, 340, 350, 370, 389, 499, El/Se 492 plus 9 hours of electives in fine arts selected in consultation with fine arts adviser. No minor is required with this major. If the above requirements plus the requirements for graduation of the College of Sciences and Arts are met, the degree will be Bachelor of Arts in Fine Arts.

Minor: 24 hours
F A 101, 103, 110, 111, 303, 320, 350, 390, El/Se 492 is recommended.

Foreign Languages and Literatures
Majors: A minimum of 24 hours in one language beyond 203 (or 20 hours past 304) plus For L 324.
German: 304, 315, 317; any two of 322, 323 or 420; 334, For L 324; plus 7 hours from Germ 333, 401 (maximum 1 hr), 432, 433, 442, 451, 452, 480. Recommended elective: For L 426.

Students who intend to obtain a teaching major in a foreign language should begin course work in that language in the freshman year. For a teaching minor in a second language or, with the permission of the adviser and the department chair, a teaching minor in another field, the student should begin work on the requirements not later than the beginning of the sophomore year. If the major and minor course programs, the requirements for the Initial Certificate, and the General University Requirements in the College of Sciences and Arts are met, the degree will be a Bachelor of Arts in Foreign Languages and Literatures.
Physics
Senior High School Major: 29 hours
Phys 201, 202, 303, 310, 320, 330 or 341, 410, 499
(4 hours includes auditing Phys 101 and 102);
Bio S 430. If additional elective hours can be taken
to satisfy the departmental requirements for
graduation, the degree should be in physics. If not, it
should be in General Studies. An approved
teaching minor must be selected.
Senior High School Minor: 20 hours
Phys 201, 202, 303, 310, 499 (4 hours includes auditing
Phys 101 and 102); Bio S 430.

Political Science
Senior High School Major:
It is possible for a student to take a degree in
political science and also meet the requirements
for the teaching major in social studies. The
student should consult with the Departments of
Political Science and Elementary and Secondary
Education concerning this program.
Senior High School Minor:
18 hours plus Hist 422, Pol S 101, 102, 206; 222;
plus 6 hours of upper-division electives in political
science, with Pol S 300 and 318 recommended.

Psychology
Senior High School Major: None
Senior High School Minor: 18 hours
Psych 105, 312 (Psych 198 may substitute for
Psych 105); Psych 321 or 350; one course from
Psych 360, 361, 361. One 400-level psychology
course (Psy 401 strongly recommended);
electives from 300- and 400-level Psych courses as
needed to reach 18 hours.

Reading
El/Se 308 or 309, 450 or 451, 430 or 431, 432 or
433, and 462 or 463; Spe 205, 371; Anth 250 or
450; plus 11 hours from El/Se 411, 434, or 435,
Sp Ed 401, El/Se 553, SpCom 251, Spe 473, CFS
240, 440, Drama 364. Those that complete El/Se
553 do not need to take El/Se 462 or 463 (2 credits
go toward the 11 hours).

Social Studies
Senior High School Major: 41 hours
15 hours from the following including at least three
fields: Anth 101, Econ 201, Hist 101, 102, 110,
Pol S 101, 102, Soc 101; plus Hist 480, Pol S
206, and 21 hours from 300-400-level courses in
the social studies are required. One-half of all the
courses in the upper-division category must be in
history and include Hist 422. For the other half,
it is strongly recommended that the student select
courses which give as much spread as possible in
the fields normally taught in the secondary schools.
The requirements for graduation of the College
of Sciences and Arts should be used to strengthen,
broaden, and supplement this major. A teaching
minor is required with this major, and English is
the suggested choice. If the above requirements
plus the requirements for graduation of the
College of Sciences and Arts are met, the degree
will be Bachelor of Sciences in General Studies.
Sociology
Senior High School Major: none

Special Education
Fifty clock hours of direct experience working with individuals with handicaps is required before certification as a special education major. Sp Ed 301, 401, 402, 403, 404; Spe 371, 473; PEP 463, Psych 390, EI/Se 462, plus 3 hours selected from CFS 240, 440, 442, EI/Se 411, 430, 431, 434, 450, 490, 499; PEEP 490; Psych 333, 360, 361, 464; RLS 454, Soc 362, S W 395, Spe 205, 281.

Speech
Communication Disorders
A competency-based program leading to an Educational Staff Associate Certificate in Communication Disorders is offered through the Department of Speech. Students interested in this program should contact the communication disorders advisor in the Department of Speech rather than the Department of Elementary and Secondary Education.

Theatre Arts and Drama
Spe 160; Drama 260; 263, 264, 361; SpCom 435; and 2 hours of Drama 396. (Major in English is recommended.)

Engineering Management
Program Director, J. A. Ringo.

Engineering Management is an off-campus program offering engineers an excellent way to acquire management skills. The program is offered at the Spokane and Vancouver WSU campuses.

Engineers and scientists will often assume positions in leadership roles on projects or as first line managers within five to ten years of receiving the baccalaureate degree. When this occurs, additional theory and practice in management skills have proven very helpful. The curriculum also includes technical courses which provide the engineer a means of keeping pace with rapid technical change. The integrated set of core and elective courses blend management and engineering interests in a single graduate degree program.

Program Requirements
The master's program with a nonthesis option consists of 33 credit hours including a minimum of 31 credit hours of approved graduate course work and a minimum of 2 credit hours of Master's Special Problems, which is a comprehensive take-home examination. The program of studies leads to a Master of Engineering Management. An overview of the engineering management curriculum can be summarized as follows:

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<tr>
<th>C E 453 Engr Admin</th>
<th>3</th>
</tr>
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<tbody>
<tr>
<td>Mgt 501 Mgt Org</td>
<td>3</td>
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<td>Stat 430 Stat Methods</td>
<td>4</td>
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<td>Mgt 584 Org Behav</td>
<td>3</td>
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<tr>
<td>Engineering Elective</td>
<td>3-12</td>
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<tr>
<td>Management Elective</td>
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E M 702 Master's Special Problems, Directed Study and/or Examination 2

Elective courses: 12 semester hours of course work may be taken as electives within the following framework:

Engineering electives: (technical elective in discipline): 3-12 hours.

Management electives: (courses in marketing, production, finance, law, computers or communications): 0-6 hours.

Admission Requirements

In general it is expected that students who wish to receive a Master of Engineering Management degree will have earned a Bachelor of Science in Engineering from an accredited program with a minimum G.P.A. of 3.0. Students with undergraduate degrees in other fields, particularly mathematics, physics, or other physical sciences, may also be accepted for this program. Requirements for additional undergraduate work in engineering (non-engineering majors) are evaluated on an individual basis. Prospective students should also plan to take the Graduate Management Admission Test (GMAT) and provide three letters of recommendation.

Description of Courses

For explanation see Index under "Symbols"

E M
564 Project Management 3 Prereq basic stat, Project organization and planning; scheduling techniques; project control; optimization techniques; project administration.

595 Advanced Topics in Engineering Management V 1-3 May be repeated for credit; cumulative maximum 6 hours. Engineering economy, decision theory, personnel management, organization theory, computers, marketing productivity, information systems, communications, public policy.

600 Special Projects or Independent Study Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

Department of English


The curriculum of the Department of English is designed for (1) students who are interested in preparing for graduate study in English, (2) students who wish specific training in the teaching of language and literature, and (3) students who desire a broad education emphasizing language and literature.

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 Elementary and Secondary Education in this catalog, and they should confer with representatives of that department 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 in English. In cooperation with the Department of History, the department participates in the interdepartmental program of American Studies leading to the degree of Bachelor of Arts, Master of Arts, and Doctor of Philosophy in American Studies. In cooperation with the Department of Foreign Languages and Literatures the department participates in the interdepartmental program in Literary Studies leading to the degree of Doctor of Philosophy (Literary Studies).

Description of Courses

For explanation see Index under "Symbols"

Engl
100 Mechanics of Composition 3 Designed to improve the student's writing ability to a level appropriate for entrance into Engl 101.

101 [W] English Composition 3 The writing of correct, coherent English prose, stressing orderly development of thought and precise exposition. Credit not granted for both Engl 101 and 105.

102 English Composition for Chicanos 3 Same as Ch St 102.

103 Basic Skills in English—ESL 3 English grammar, composition, and pronunciation for foreign students.

104 Intermediate Grammar and Basic Skills—ESL 3 More complex aspects of English syntax and the development of basic reading, abstracting, and writing skills.

105 [W] Freshman Composition for ESL Students 3 Special grammatical and rhetorical problems of ESL students. Credit not granted for both Engl 105 and 101.

106 Conversation—ESL 1 May be repeated for credit; cumulative maximum 2 hours. Oral communication designed specifically to fill the needs of international students with such difficulties.

108 [H] Reading Literature 3 Reading for pleasure, appreciation, and enlightenment: short stories, novels, plays, poetry.

198 [W] English Composition Honors 3

199 [H] English Composition and Literature Honors 3

200 [W] Expository Writing 1 Not open to freshmen.


209 [H] Survey of English Literature to 1750 3

210 [H] Survey of English Literature to 1900 3

216 Main Currents in American Culture 3 Great works of American culture since the 17th century

245 [H] American Literature to 1855 3

246 [H] American Literature Since 1855 3

255 English Grammar 3

1Open only to students in the Honors Program.
256 The Organization of English: 3 Technical Introduction to the structure of words and sentence of natural languages and to the study of linguistic meaning.


304 Chaucer: 3 Poetry and prose of Geoffrey Chaucer.

305 [H] Shakespeare 3 Shakespearean drama to 1600.

306 [H] Shakespeare 3 Shakespearean drama after 1600.


308 [H] Introduction to Literary Criticism 3

311 [G] Asian American Literature 3 Same as APAS 311.

312 Hawai‘i/Pacific American Literature 3 Same as APAS 312.

319 Black Literature in America, 1700-1900 3 Same as BI St 319.

320 Black Literature in America, 1900 to Present 3 Black literature from the Harlem Renaissance to the present.

323 Approaches to the Teaching of English: 3 English literature and composition in secondary schools.

332 Poetry: 20th Century 3 20th century poetry including Continental.

333 Fiction: 20th Century 3 20th century fiction including Continental.

334 Drama: 20th Century 3 20th century drama including Continental.

335 [H] The Bible as Literature 3

338 Topics: Major Trends and Figures 3 May be repeated for credit; cumulative maximum 6 hours. Literary trends of major writers.

339 Film as Literature 3 May be repeated for credit; cumulative maximum 6 hours. Analytical study of film as a major literary genre.

341 Native American Literature 3 Same as Na Am 341.

351 Creative Writing: Prose 3 Prereq: Eng 101.

352 Creative Writing: Poetry 3 Prereq: Eng 101.

354 History of the English Language 3 Prereq 1 yr For L. Language related to the origin, history, and literature of its speakers.

355 Women Writers 3 Women's artistic and intellectual contributions to prose, fiction, drama, and poetry.

366 The English Novel: Defoe to Eliot 3

367 The English Novel: Meredith to the Present 3

368 American Fiction to 1900 3

369 American Fiction Since 1900 3

391 Topics in English 3 Study Abroad (London).

392 Topics in English 3 Study Abroad (London).

401 Advanced Writing 3 Advanced problems in writing, criticism, and research.


403 [W] Professional and Technical Writing—ESL 3 Technical writing techniques, formal report preparation; focus on special grammatical and rhetorical problems of ESL students.

406 English Renaissance Literature 3 3 Non-dramatic literature of the period 1500 to 1600.

407 English Renaissance Literature II 3 Non-dramatic literature of the period 1600 to 1660.

409 English Renaissance Drama 3 English drama to 1660. (a/y)

413 Seminar in American Studies 3 Credit not granted for both Engl 413 and 513.

415 Dryden, Pope, and Johnson 3 Neo-classical literature from 1660 to 1798.

416 English Romantic Literature 3 Victorian Literature 3

443 Problems in English Linguistics: Syntax and Phonology 3 May be repeated for credit; cumulative maximum 6 hours. Credit not granted for both Engl 443 and 543.

451 Advanced Creative Writing: Prose 3 May be repeated for credit; cumulative maximum 6 hours.

452 Advanced Creative Writing: Poetry 3 May be repeated for credit; cumulative maximum 6 hours.

458 Topics in Sociolinguistics and Psycholinguistics 3 May be repeated for credit; cumulative maximum 6 hours. Relationship of language to social and psychological structures.

470 American Culture Series 3 May be repeated for credit; cumulative maximum 6 hours. The West in American literature; American Studies topics.

471 Literary Movements in America Through WWI 3 May be repeated for credit; cumulative maximum 6 hours. Puritanism, Romanticism, Realism-Naturalism.

472 20th Century American Literature 3 May be repeated for credit; cumulative maximum 6 hours. Literary movements in modern and contemporary American writing.

475 Topics in English 3 May be repeated for credit; cumulative maximum 12 hours. Literature of special or current interest: detective fiction, science fiction, feminism in literature, children's literature, and others.

498 Internship V 1-15 May be repeated for credit; cumulative maximum 15 hours. Prereq junior in Engl. Off-campus cooperative education learning experience in business or industry in English-related jobs.

499 Special Problems V 1-4 May be repeated for credit.

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 Contemporary theories of composition and their application to the classroom.

503 Old English: Anglo-Saxon 3

504 Old English: Beowulf 3

505 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.

506 Seminar in 16th Century English Literature 3 May be repeated for credit; cumulative maximum 6 hours.

507 Shakespeare's Plays, poems, criticism, and background materials.

508 Seminar in Diagnosis and Evaluation of Writing 3 Problems involved in the diagnosis and assessment of student writing.

510 Backgrounds of American Literature 3 Dominant themes in American literature and their European origins.

511 Seminar in 17th and 18th Century American Literature 3

512 Introduction to Graduate Study 3

513 Seminar in American Studies 3 May be repeated for credit. Same as Hist 513. Credit not granted for both Engl 413 and 513.

514 Seminar in 20th Century American Literature 3 May be repeated for credit; cumulative maximum 6 hours.

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.

537 Seminar in English Literature 3 Major topics and figures. May be repeated for credit; cumulative maximum 6 hours.

541 Seminar in TESOL and Linguistics 3 May be repeated for credit; cumulative maximum 6 hours. Cooperative course taught at the University of Idaho (Eng ID510).

543 Problems in English Linguistics: Syntax and Phonology 3 May be repeated for credit; cumulative maximum 6 hours. Graduate level counterpart of Engl 443; additional requirements. Credit not granted for both Eng 443 and 543. Joint listing with the University of Idaho (Eng ID510).

549 TESOL: Theory and Methods 3 May be repeated for credit; cumulative maximum 6 hours. Theoretical issues and practical experience in ESL, classroom situations.

564 Literary Criticism 3 Theories of literature from Plato and Aristotle to the present.

548 Seminar in Literary Criticism 3 May be repeated for credit; cumulative maximum 6 hours. Problems in the theory and practice of literary criticism.

549 Seminar in 20th Century British Literature 3 May be repeated for credit; cumulative maximum 6 hours.

550 Seminar in Poetry or Non-Fiction 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

555 Seminar in Middle English Literature 3 May be repeated for credit; cumulative maximum 6 hours.

560 Seminar in Drama 3 Historical and generic studies in dramatic literature. May be repeated for credit; cumulative maximum 6 hours.

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 6 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.

591 Seminar in Literary Studies 3 May be repeated for credit; cumulative maximum 6 hours. Same as For L 591.

595 Topics in English 3 May be repeated for credit; cumulative maximum 6 hours.
Most of the hours required for the bachelor's degree in this program must be in upper-division courses. Four programs are offered for the English major, all leading to the degree of Bachelor of Arts in English. Option I is a traditional English program for the professional. Option II is a program for English education majors (see Department of Elementary and Secondary Education). Option III is a program for students who want a broad education emphasizing language and literature. Option IV, English/Business, is designed to prepare students for careers in business through an education combining selected professional training with a broad education in liberal arts and language courses.

The department also offers a minor in English.

Option I: Professional Major—39 hours

A) Three from Eng 209, 210, 245, 246
9
B) Eng 301, 401
6
C) Two from Eng 304, 305 or 306, 307, 308
6
D) One from each of the following groups:
   1) Eng 255, 256, 354, 458
   3
   2) Eng 406, 407, 409
   3
   3) Eng 366, 415
   3
   4) Eng 367, 416, 417
   3
   5) Eng 470, 471, 472
   3
   6) Eng 316, 319, 320, 368, 369
   3

Option II: Teaching Major—39 hours

A) Three from Eng 108, 209, 210, 245, 246
9
B) Eng 301, 401, 308, 323
12
C) Two from Eng 304, 305, or 306, 307, 308, 415
6
D) One from each of the following groups:
   1) Eng 366, 367, 416, 417
   3
   2) Eng 316, 320, 368, 369, 471, 472
   3
   3) Eng 332, 333 or 334
   3
   4) Eng 255, 256, 354, 458
   3

Option III: General Major—39 hours

A) Three from Eng 108, 209, 210, 245, 246
9
B) Eng 301, and one from 351, 352, 401 or 402
6
C) Two from:
   1) Eng 255, 256, 354, 458
   6
   2) Eng 304, 305 or 306, 307
   6
   3) Period courses numbered above 400
   6
D) One from general courses numbered above 300
3

Option IV: English/Business

Requirements for graduation include 21 hours in language and literature courses, 9 hours in writing courses, 18 hours in business core courses, and 7-11 hours in computer science related courses. A student must also fulfill the graduation requirements of the College of Sciences and Arts.

The English selections emphasize courses to develop verbal skills and courses devoted to the major events of our literary culture. The business and computer science core courses create the curriculum requisite for beginning a career in business. The combination develops potential placement opportunties and insures graduates flexibility, successful performance, and professional advancement in various business careers, especially the many requiring effective contact and communication with others.

A) Three from Eng 209, 210, 245, 246
B) Eng 101 or 198, 301, and one from 351, 352, 401, or 402
C) One from each of the following:
   1) Eng 255, 256, 354, 458
   2) Eng 304, 305, 306, 307
   3) Two from literature courses numbered above 300

Business Core Courses: B Law 210, QMeth 215 or Acctg 230, Econ 102 or 203, Mgt 301, Fin 325, Mkgr 260.

Computer Science Core Courses: One from Math 107, 201, 202; Cpt S 150; one from Cpt S 151, 153, 154, 241.

English Minor

The student must complete a minimum of 16 hours in English courses (excluding 101, 108, 198, and 199), half of which must be upper-division. The 16 hours must also include one composition course beyond Eng 101.

Preparation for Graduate Study

Students interested in graduate programs in English at Washington State University need to offer preparation in English courses generally approximating one of the four 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. Every student should be well grounded in at least one modern foreign language.

Department of Entomology

Professor and Department Chair, E. P. Caits; Professors, R. D. Akre, A. A. Berryman, R. F. Harwood; Associate Professors, J. J. Brown, G. E. Long, G. L. Piper, W. J. Turner; Assistant Professor, L. K. Tanigoshi.

Insects and related arthropods are the dominant consumers in all terrestrial ecosystems. There are far more kinds of insects than all other creatures combined. They compete at all levels with humans in the production, processing and use of food and fiber resources. They are a major health threat to most of the world's people. In-depth knowledge in basic areas of insect identification, morphology, physiology, behavior and ecology are prerequisites to developing and applying control measures against our arthropod competitors. Ecological and legal restrictions on pesticide usage requires people knowledgeable in the safe use of pesticides and in the effect of such use on the total environment.

The entomology curriculum provides the opportunity to study the basic and applied aspects of entomology. Courses are designed for majors and non-majors, providing needed training for students in agriculture, education, veterinary medicine, microbiology, public health, environmental sciences, and natural sciences. The curriculum prepares students for graduate study in entomology or for employment in institutional or private pest control oriented areas. An interdisciplinary curriculum in integrated pest management (IPM) is available to students with interests that span entomology and pest management. The curriculum is described under the Department of Adult and Youth Education section of this bulletin.

Facilities are available for graduate study in the major areas of entomology: apiculture, behavior, biological and integrated control, economic entomology; ecology, forest entomology, insect-plant relationships, medical and veterinary entomology, morphology, physiology, and taxonomy. Departmental faculty at outlying research centers also serve as advisers for graduate student research, and sometimes teach audio courses. Extensive insect collections, computer and video facilities support teaching and research.

The department offers courses of study leading to the degrees of Bachelor of Science in Entomology, Master of Science in Entomology, and Doctor of Philosophy.

Description of Courses

For explanation see Index under "Symbols"
448 Medical Entomology 4 (3-3) Prereq Bio 503, 104. Insects and related arthropods affecting human and other vertebrate animal health; means of control. (a/y)

450 Principles of Applied Entomology 4 (3-3) Prereq Entom 340 or 343. Utilization of biological, physical, cultural, and chemical factors in managing insect populations. (a/y)

462 Systems Analysis in Integrated Crop Management 3 (2-3) Prereq basic ecology; major in biological sciences. Techniques and theory for evaluation and use of decision-support models. Credit not granted for both Entom 462 and 552. (a/y)

472 Aquatic Entomology 1 Identification and biology of insects associated with aquatic and subaquatic environments. Cooperative course taught at the University of Idaho (Ent ID 472).

474 Aquatic Entomology Lab 2 (0-6) Prereq c// in Entom 472. Field trips required. Cooperative course taught at the University of Idaho (Ent ID 474).

480 Urban Entomology 3 (2-3) Prereq Entom 340 or 343. Biology and management of arthropod and non-arthropod pests in urban-industrial communities; pests of structural, household, and recreational importance. Credit not granted for both Entom 480 and 580. (a/y)

484 Insect Anatomy and Physiology 4 (3-3) Prereq Entom 484. Organ systems of insects and their physiological functions. (a/y) Cooperative course taught at the University of Idaho (Ent ID 484).

499 Special Problems V 1-4 May be repeated for credit.

511 Principles of Systematic Biology 3 (2-3) Same as Zool 511.

517 Entomological Literature 2 Survey and use of entomological literature and bibliographic aids. (a/y) Cooperative course taught at the University of Idaho (Ent ID 517).

541 Advanced Insect Ecology 3 (2-3) Prereq Entom 343; general ecology or Entom 443. Population and community dynamics; theory and application in natural and artificial systems. (a/y) Cooperative course taught at the University of Idaho (Ent ID 541).

542 Insect Behavior 4 (3-3) Prereq 10 hrs Entom. Principles of behavior of insects; orientation to environmental conditions. (a/y)

543 Population Management 2 (1-3) Prereq Math 171; Cpl S 201 or 210; and ecology course. Systems approach to theoretical population ecology and its application to management problems. (a/y)

544 Aracology 3 (2-3) Prereq Entom 441. Identification, biology, and ecology of free-living and parasitic mites. (a/y)

545 Toxicology of Pesticides 3 Prereq Chem 240, Zool 222, or Entom 340 or 343. General principles of pesticide toxicology; classification, mode of action and metabolism of each group of farm pesticide chemicals. (a/y)

547 Biological Control of Arthropod Pests and Weeds 4 (2-6) Graduate level counterpart of Entom 447; additional requirements. Credit not granted for both Entom 447 and 547. Cooperative course taught at the University of Idaho (Ent ID 547).

550 Insect Physiology 4 (3-3) Prereq Chem 240, Zool 352; Zool 222, or Entom 340 or 343. General principles of insect physiology; the mechanisms of vital processes in insects; organ, cellular, subcellular, chemical and physical levels. (a/y)

560 Photography for Entomologists 2 (1-3) Prereq Entom 343. By interview only. Techniques of scientific photography; macrophotography, cinematography, and microphotography; use of specialized films and methods. (a/y)

561 Quantitative Methods in Entomological Research 4 (3-3) Prereq Math 171; Cpl S 201; 20 hours biological sciences. Practical methods for the acquisition, storage, analysis, and presentation of entomological data. (a/y)

562 Systems Analysis in Integrated Crop Management 3 (2-3) Graduate level counterpart of Entom 462; additional requirements. Credit not granted for both Entom 462 and 562. (a/y)

580 Urban Entomology 3 (2-3) Graduate level counterpart of Entom 480; additional requirements. Credit not granted for both Entom 480 and 580. (a/y)

593 Seminar 1 May be repeated for credit. Prereq 20 hrs biology. Reporting problems and research in entomology.

596 Developmental Systems in Insects 3 Prereq Entom 550 or 484. Insect physiology concentrating on hormones, reproduction, vitellogenesis, embryo, maturation, and metamorphosis. (a/y) Cooperative course taught at the University of Idaho (Ent ID 596).

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Schedule of Studies

At least 40 of the total hours required for the bachelor's degree in this curriculum must be in upper-division courses.

A major in entomology requires Entom 343 and 441, plus a minimum of 11 hours of Entom electives and the following: Ag Ec 201 or Econ 102; Bio 103, 104, 372; Bot 332 or 320; Chem 105, 106 and 240 or 243; Eng 101; and at least 2-3 hours in writing and 2-3 hours communication skills (writing or speech); GenCB 301; Math 140 or 171; Phys 101 and another physical science course; Zool 352 or 353; Zool 224 or Bot 120.

Students planning to become pest control consultants or pest management specialists should include courses in pest management; IPM 201, 452, 462, PsI 329; Soils 201; Agron 305, Ag Ec 201; Stat 310 or 412 and crops courses in agronomy and horticulture.

Entomology Minor

A minimum of 16 hours is required for the minor and must include Entom 343, 441, or 442 and 9 hours from: Entom 348, 443, 444, 448, 450, 462, 480; IPM 201, 452, 462.

Preparation for Graduate Study

As preparation for work toward an advanced degree in entomology, a student should complete an undergraduate major in some field of biological science, chemistry, forestry or agriculture. Background work should include courses in general biology, organic chemistry, physics, genetics, invertebrate biology, ecology, botany, calculus, entomology, insect taxonomy and zoology.
Program in Environmental Science and Regional Planning

301 Forest and Range Environments 3 Same as FRM 301.
303 [U] Conservation of Renewable Resources 3 Same as FRM 303.
303 Environmental Geology 3 Same as Geol 403.
404 The Ecosystem 3 (2-3) Prereq Math 171; Cpt S 150 plus one of 151-144; Bio S 372. Analysis and simulation of ecosystem processes: dual emphasis on ecological principles and development of models to evaluate policy for management. Credit not granted for both Env S 404 and 504.
411 Limnology 3 Same as Zool 411.
412 Forest and Range Policy and Administration 3 Same as FRM 412.
414 Introduction to Environmental Biophysics 2 Same as Solls 414.
415 Environmental Biophysics Lab 1 (3-3) Same as Solls 415.
425 Economic Analysis of Public Projects and Policies 3 Same as Ag Ec 425. Credit not granted for both Env S 425 and 525.
427 Environmental Chemistry 2 Same as Chem 427.
444 Environmental Impact Statement Assessment 3 (2-3) Analysis of environmental impact statements and their legal framework; methods of environmental assessment and trade-off development of an impact statement. Credit not granted for both Env S 444 and 544.
445 Hazardous Waste Management 3 (2-3) Prereq Math 171; Solls 201 or Geol 102. Environmental, technical, and political aspects of hazardous waste management; evaluative methods, risk assessment, and current management requirements. Credit not granted for both Env S 445 and 545.
471 Meteorology 3 Same as C E 471. Credit not granted for both Env S 471 and 571.
480 Advanced Resource Economics 3 Same as Ag Ec 480.
481 Economics of Environmental Issues 3 Same as Econ 481.
493 Seminar 1 May be repeated for credit; cumulative maximum 6 hours.
495 Undergraduate Internship V 1-12 May be repeated for credit; cumulative maximum 12 hours. 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.
504 The Ecosystem 3 (2-3) Graduate level counterpart of Env S 404; additional requirements. Credit not granted for both Env S 404 and 504.
505 Principles of Toxicology 3 Same as P T 505.
508 Air Pollution Control Engineering 3 Same as C E 508.
520 Special Topics 2 May be repeated for credit; cumulative maximum 6 hours.
531 Special Topics in Air Pollution V 1-3 May be repeated for credit; cumulative maximum 6 hours. Same as C E 521.
532 Economic Analysis of Public Projects and Policies 3 Graduate level counterpart of Env S 425; additional requirements. Credit not granted for both Env S 425 and 525.
536 Modeling and Simulation of Ecological Systems 3 Same as Cpt S 536.
544 Environmental Impact Statement Assessment 3 (2-3) Graduate level counterpart of Env S 444; additional requirements. Credit not granted for both Env S 444 and 544.
545 Hazardous Waste Management 3 (2-3) Graduate level counterpart of Env S 445; ad-
ditional requirements. Credit not granted for both Env S 445 and 545.
549 Solid Waste Management and Design 3 (2-3) Same as C E 549.
550 Legal Process 3 Law and legal processes as they relate to resource decisions, management, development, and preservation. Cooperative course taught at the University of Idaho (Law IDS11).
560 WaterShed Management 3 Same as FRM 560.
571 Meteorology 3 Same as C E 571. Credit not granted for both Env S 471 and 571.
572 Air Pollution Measurement Techniques 3 (3-3) Same as C E 572.
574 Air Pollution Abatement and Administration 2 Same as C E 573.
574 Air Pollution Seminar 1 Same as C E 574.
584 Engineering Aspects of Aquatic Biology 4 (3-3) Same as C E 584.
588 Land and Resource Regulation 3 Prereq R P 550. Legal analysis methods and concepts for non-law students in resource management. Cooperative course taught at the University of Idaho (Geog D420).
589 Atmospheric and Chemical Processes 3 Same as C E 589.
593 Seminar in Environmental Science 1 May be repeated for credit; cumulative maximum 4 hours.
595 Graduate Internship V 1-12 May be repeated for credit; cumulative maximum 12 hours. By interview only. Practical work experience in appropriate agencies; for graduate career students.
600 Special Projects or Independent Study Variable credit.
700 Master's Research, Thesis, and/or Examination Variable credit.
702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

Regional Planning

418 Human Issues in Intersessional Development 3 Same as Anth 418.
450 Principles and Practice of Planning 3 Prereq Env S 101. History, theory, methods, and processes in regional planning; contemporary issues and professional practice.
472 Economic Development and Underdevelopment 3 Same as Econ 472.
474 Remote Sensing Applied to Terrain Evaluation 3 (2-3) Same as Solls 474.
490 Planning and Design in Developing Countries 3 Ecological, cultural, and economic considerations of planning and design in developing nations.
503 Principles of Public Land Management Planning 3 Same as FRM 503.
526 Educational Resources for Community Problem Solving 3 Same as Ed Ad 526.
535 Regional Planning Theory 2 Prereq Pol S 102; Econ 203. Theories of planning; synthetic, incremental, transactive, and radical planning traditions; quantitative planning theories.
540 Planning History 3 Prereq Soc 101. Development of regional planning in various civilizations from classical times to present days.
541 Planning in Rural Environments 3 Prereq R P 540. Planning theories and methods applied to rural regions, issues, and problems unique to rural planning.
546 Public Budgeting 3 Same as Pol S 546.
550 Methods and Processes in Regional Planning 3 (2-3) Prereq R P 540; Bio 412. Basic analysis and approaches to planning; implementation techniques; planning agencies.
567 Regional Landscape Inventory and Analysis 3 (2-3) Graduate level counterpart of L A 467; additional requirements. Credit not granted for both L A 467 and R P 567.
568 Community and Economic Development 3 Prereq R P 550, 557. Applied community development planning as it affects public and private projects from goal specification to implementation.
575 Geographic Information Systems 3 Prereq course in computer programming. Computerized management of data organized on regional geographic bases; preparation of maps, coding, and manipulation of data for regional planners and land managers. Cooperative course taught at the University of Idaho (Geog D475).
590 Special Topics in Regional Planning V 1-3 May be repeated for credit.
593 Seminar in Regional Planning 1 May be repeated for credit.
600 Special Projects or Independent Study Variable credit.
700 Master's Research, Thesis, and/or Examination Variable credit.
702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

Schedule of Studies

This course of study for the bachelor's degree is organized around the requirements listed below. Additionally a sequence will be designed by each student and the major advisor to provide training depth in one of eight optional areas of specialization: agricultural ecology, biological science, human ecology, environmental education, environmental quality control, natural resources, physical science, or regional and land use planning. (Fact sheets on each option are available from the program office.) At least 40 of the total hours required for the Bachelor of Science in Environmental Science must be in the upper-division courses, 18 of which are in the chosen area of specialization (normally in more than two departments.) Majors in environmental science must satisfy General University Requirements as specified for majors in the College of Sciences and Arts. Many of these requirements are built into the curriculum below. Students should note the lack of specific courses in the humanities, at least 6 hours of which must be included in their course work. Each major must also complete 8 hours in a modern foreign language unless he/she has completed two years of such language in high school (or one year in high school and four hours in the same language at WSU). The program provides a strong foundation for advanced study in many professional and basic research fields.

Freshman Year

**First Semester**
- Env S 101 Env & Human Life 4
- Engl 101 Composition 3
- Chem 105 Principles 3
- Math 107 or 201 3
- Soc 101 Introduction 3

**Second Semester**
- Anth 101 General 3
- Chem 106 Principles 3
- Chem 107 2
- Math 171 or 202 3-4
- Econ 201 Principles 4
Sophomore Year
First Semester
Bio S 103 Introductory
Phys 101 or 201
Geol 102 or Soc 101
Engl 201, 301, or 402
Cpt S 150 or 203 or 151 or 153
Hours
4
4-3
3
2-4
Second Semester
Bio S 104 Introductory
Phys 102 or 202
Chem 240 or 340/341
Humanities Elective
Hours
4
4
4-5
3

Junior Year
First Semester
Micro 101 or 202
BC/BP 364 Intro Biochem
BC/BP 356 Intro Biochem Lab
Upper-division Pol 3
Env S 493 Seminar
Electives/Option Courses
Hours
4-5
3
1
1
4-5
Second Semester
Upper-division Anth 2
Bio S 372 General Ecology
Env S 493 Seminar
Elective/Option Courses
Hours
4
1
1
7

Senior Year
First Semester
Env S 404 Ecosystem
Bio S 474 Human Ecology
Upper-division Soc 1
Env S 493 Seminar
Electives/Option Courses
Hours
3
3
1
1
4
Second Semester
Upper-division Econ 1
Stat 412 (or other statistics)
Env S 444 Impact Statements
Env S 493 Seminar
Electives/Option Courses
Hours
3
1
3
1
4

1 Geol 403 is acceptable as a substitute for this requirement.
2 Anthropology—Anth 304, 309, or upper-division ethnology or ethnography course.
3 Political Science—Pol S 423 or upper-division public policy formation course.
4 Sociology—Soc 330, 331, or 431.
5 Economics—Econ 316, Ag Ec 380, or Econ 472 or 482.

NOTE: Courses taken to fulfill the above requirements, as listed, cannot be taken to satisfy requirements for the option. Beyond those options listed, students are encouraged, in close consultation with an advisor, to create their own option, one more closely fitted to their specific needs. Such option alternatives must be approved by the program advisor. Those students taking a dual major or who already have a bachelor’s degree may use the other degree program as a substitute for the option, with their advisor’s permission.

Preparation for Graduate Study
Before applying for admission to the graduate programs, a student should have completed an undergraduate curriculum that included examination of a physical, biological, or social system in sufficient depth to serve as background for advanced investigation of one or more of these systems in an ecological context and a minimum g.p.a. of 3.0. For graduate study in environmental science, previous course work in sociology or cultural anthropology, conservation of natural resources, biology, chemistry or physics, calculus, and ecology is required. Students interested in assistantships should provide Graduate Record Examination Scores. General requirements for the Master of Science degree in Environmental Science include upper-division or graduate-level courses in ecology, mathematics, statistics, or computer science; applied, physical, biological, or social science; environmental impact statement assessment; graduate seminar; and special topics in environmental science; an option (an area of specialization) with a minimum of 10 credit hours of courses; and a thesis or special project. A minimum of 32 hours of graduate credit is required. The program has been successful in placing MS graduates in a variety of positions with federal, state, and local agencies, industries, and academia, as well as environmental and resource management specialists.

Students entering the Master of Regional Planning program (MRP) program have a wide variety of backgrounds in the natural and social sciences. There are no specific prerequisite course requirements for entrance, but applicants are expected to have a minimum g.p.a. of 3.0 in their undergraduate field and to present evidence of commitment to the field of planning. Prior work experience in planning or related fields is strongly considered in evaluating applicants. Students are required to complete not less than 48 graduate credit hours, including a minimum of 18 hours of core planning courses, 6 hours of thesis or project credit, and 4 hours of field internship or practicum.

A cooperative arrangement with Eastern Washington University’s Urban Planning Department allows students to undertake course work or study with faculty from EWS on a selective basis. MRP candidates are expected to develop a specialization through course work in an allied discipline, but the philosophy of the program is oriented toward preparing graduates for practice in public agencies, tribal agencies, or as consultants in the private sector. Graduates of the program are employed as professional planners, and students are encouraged to work part time while earning their degrees.

Department of Fine Arts
Professor and Department Head, A. Okazaki; Professors, R. Coates, R. Feesley, F. Ho; Associate Professors, J. Dollhausen, J. Hockenhull, R. Helm, J. Schuman, F. Silser; Assistant Professors, S. Platt, R. Robjillard.

The Fine Arts Department offers a diversity of experiences in the visual arts. Courses are designed to give the student both historical perspectives and practical skills in a variety of media. Students interested in preparing for secondary and primary teaching find that the department, working with the Department of Elementary and Secondary Education, provides ample training for them as artists and teachers. Those in art education who wish to take a Bachelor of Arts in Fine Arts should complete the minimum departmental requirements of 53 hours.

The department offers courses of study leading to the degrees of Bachelor of Arts in Fine Arts and Master of Fine Arts.

Description of Courses
For explanation see Index under “Symbols”
Foundation
FA
101 [H] Introduction to Art 3 For non-majors.
Appreciation of various visual art forms; emphasis on contemporary period.
103 Art 3 (0-6) Introduction to formal elements through studio experience.

Art History
FA
104 Black Visual Arts 3 Same as BI St 102.
201 [H] Art of Western Civilization 3 Historical survey of art and architecture from the Renaissance to the present.
202 [H] Art of Western Civilization 3 Historical survey of art and architecture from the High Renaissance to the present.
301 The Classical Heritage in Western Art 3 Prereq F A 201 or 202. The influence of the classical heritage of Greece and Rome on later civilizations down to the 20th century.
302 Renaissance Art 3 Prereq F A 202. Painting, sculpture, and architecture in western Europe from the 14th through the 16th century.
303 Modern Art—19th Century 3 Modern art in the early modern period.
304 Modern Art—20th Century 3 Modern art in the 20th century.
305 Chicano Art 3 Same as Ch St 321.
310 Women Artists 3 Same as W St 310.
403 Topics in Advanced Art History 3 Modern and contemporary art.
404 Topics in Advanced Art History: Pre-19th Century 3 Selected areas of modern art for advanced students.
500 Graduate Art History 2 May be repeated for credit; cumulative maximum 6 hours. Prereq 9 hrs undergraduate art history.

Studio Courses
Note: unless specified, media used in studio courses are at the option of the instructor.
Drawing
FA
110 Figure Drawing 3 (0-6) Composition in pictorial space, visualization of ideas, drawing from life.
111 Figure Drawing 3 (0-6) May be repeated for credit. Prereq F A 103, 110 or 111.
312 Figure Drawing 3 (0-6) May be repeated for credit. Prereq F A 103, 111.
510 Graduate Drawing 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.
511 Graduate Drawing 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.
512 Graduate Drawing 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

Painting
FA
320 Beginning Painting 3 (0-6) Basic painting; introduction to composition and color structure.
321 Painting 3 (0-6) May be repeated for credit; cumulative maximum 9 hours. Prereq F A 320.
322 Transparent Watercolor 3 (0-6) May be repeated for credit; cumulative maximum 9 hours. Prereq F A 320.
423 Advanced Painting 3 (0-6) or 6 (0-12) May be repeated for credit. Prereq F A 321. F A majors only.
520 Graduate Painting 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.
521 Graduate Painting 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.
522 Graduate Painting 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

Graphic Design
F A
331 Graphic Design 3 Introduction to visual communication.
332 Graphic Design 3 (0-6) Prereq F A 103, 110 or 111, 331.
433 Illustration V 3 (0-6) or 6 (0-12) May be repeated for credit. Prereq F A 111, 320. Editorial, scientific, and advertising. F A majors only.
434 Graphic Design V 3 (0-6) or 6 (0-12) May be repeated for credit. Prereq F A 331, 332. F A majors only.
495 Graphic Design Internship V 5-12 Prereq F A 343; major in F A, Practical field experience.
530 Graduate Graphic Design 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.
531 Graduate Graphic Design 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.
532 Graduate Graphic Design 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

Ceramics
F A
340 Ceramics 3 (0-6) Forming processes; the potter's wheel; glazing; firing.
341 Ceramics 3 (0-6) May be repeated for credit; cumulative maximum 9 hours. Prereq F A 340.
442 Ceramics V 3 (0-6) or 6 (0-12) May be repeated for credit. Prereq F A 341. F A majors only.
540 Graduate Ceramics 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.
541 Graduate Ceramics 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.
542 Graduate Ceramics 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

Sculpture
F A
350 Sculpture 3 (0-6) Manipulation of form in three dimensional space.
351 Sculpture 3 (0-6) May be repeated for credit; cumulative maximum 9 hours. Prereq F A 350.
452 Sculpture V 3 (0-6) or 6 (0-12) May be repeated for credit. Prereq F A 351. F A majors only.
550 Graduate Sculpture 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.
551 Graduate Sculpture 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.
552 Graduate Sculpture 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

Metalworking
F A
360 Metalworking 3 (0-6) Small metal sculpture and jewelry design.
361 Metalworking 3 (0-6) May be repeated for credit; cumulative maximum 9 hours. Prereq F A 360.
462 Metalworking V 3 (0-6) or 6 (0-12) May be repeated for credit. Prereq F A 361. F A majors only.

560 Graduate Metalworking 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.
561 Graduate Metalworking 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.
562 Graduate Metalworking 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

Printmaking
F A
370 Printmaking 3 (0-6) May be repeated for credit; cumulative maximum 9 hours. Prereq F A 103, 110 or 111.
471 Printmaking V 3 (0-6) or 6 (0-12) May be repeated for credit. Prereq F A 370. F A majors only.
570 Graduate Printmaking 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.
571 Graduate Printmaking 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.
572 Graduate Printmaking 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

Photography
F A
380 Introduction to Photography 3 An experience with cameras and associate materials and techniques; photography in an historical and aesthetic context.
381 Photography 3 (0-6) Prereq F A 103, 110 or 111. Beginning darkroom techniques.
382 Photography 3 (0-6) Prereq F A 381.
483 Photography V 3 (0-6) or 6 (0-12) May be repeated for credit. Prereq F A 382. F A majors only.
580 Graduate Photography 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.
581 Graduate Photography 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.
582 Graduate Photography 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

Art Education
F A
389 Art Media for Schools 3 (0-6) Required in art education. Experiences in a variety of media utilized in public schools.

Gallery Procedures
F A
490 Gallery Procedures V 3 (0-6) to 6 (0-12) May be repeated for credit; cumulative maximum 9 hours. Gallery concepts and management; budget, installation designs, art handling, graphics, art publication, and films.

Special Topics, Seminars, and Thesis
F A
400 Special Topics V 1-6 May be repeated for credit; cumulative maximum 18 hours.
492 Designing Art Programs for the Public Schools 3 Same as El/Se 492.
498 Seminar 2 May be repeated for credit; cumulative maximum 4 hours. For juniors and seniors in F A. Required for F A majors.
499 Special Problems V 1-4 May be repeated for credit.

598 Graduate Seminar 2 May be repeated for credit; cumulative maximum 4 hours.
600 Special Projects or Independent Study Variable credit.
700 Master's Research, Thesis, and/or Examination Variable credit.

Study Abroad
F A
306 Topics in Art 3 Study Abroad (Guadalajara).
311 Topics in Art 3 Study Abroad (Guadalajara).
314 Topics in Art 3 Study Abroad (London).
315 Topics in Art 3 Study Abroad (London).
316 Topics in Art 3 Study Abroad (Avignon).
317 Topics in Art 3 Study Abroad (Avignon).
318 Topics in Art 3 Study Abroad (Cologne).
319 Topics in Art 3 Study Abroad (Cologne).

Schedule of Studies

For a bachelor's degree in fine arts a total of at least 53 hours of fine arts are required, 18 of these hours must be in upper-division courses.

Required Courses:
All art majors are required to have completed the following courses or their equivalents:
Foundation
F A 103—3 hours.
Art History
F A 101, 201, 202, 303, 304—15 hours.
Drawing
F A 110, 111—16 hours.
Painting
F A 320—3 hours.
Sculpture
F A 350—3 hours.
3-D studio in addition to F A 350—3 hours.
Seminar
F A 498—2 hours.

Hours
Required Courses
35
GUR
47
F A Electives (emphasis)
18
Electives
20
Total
120

Note for Secondary School Program in Art Education: Required courses for F A students (33 hours); 14 hours F A electives; F A/El/Se 389; El/Se 492. Recommended electives for F A and El/Se majors: F A 101, 360, 340, 370, and 3 hours upper-division electives in F A.

Art Minor
A minor in art requires 18 hours including F A 103 Art, F A 110 Drawing, and F A 303 Modern Art. The remaining 9 hours of electives must be in upper-division courses.

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.

Preparation for Graduate Study
The Fine Arts Department graduate program offers the MFA degree in two-dimensional studio arts and in three-dimensional studio arts. The student may place major or minor emphasis in any of the following areas: Drawing, Graphic Design, Painting, Photography, Printmaking, Ceramics, Metalworking, and Sculpture.
Department of Food Science and Human Nutrition

Professor and Department Chair, D. J. Lee; Professors, C. J. Brekke, F. H. Hoskins, L. O. Luededeck, C. W. Nagel, Y. Pomeranz, B. G. Swanson; Associate Professors, S. Burkas, K. Funk, G. Jennings, H. Koehler, L. Massey, M. Mitchell, J. R. Powell, S. E. Spayd; Assistants Professors, J. Armstrong, E. Augustin, L. Brady, L. Branen, V. Hillers, E. Schanau; Instructors, R. Holland, S. Scheunemann.

The Department of Food Science and Human Nutrition offers courses of study in two major fields—food science and human nutrition and foods. Curricula and options are available in various special areas in both food science and human nutrition and foods.

Food science is the profession and field of study in which the biological and physical sciences are used to learn the nature of foods, the causes of their deterioration or change and the principles underlying processing and improvement of foods for the consuming public.

The undergraduate food science curriculum closely follows the recommendations of the national professional organizations, the Institute of Food Technologists and the American Dietetic Association. The curriculum also provides an introduction to the modern processing technology applicable to four principal food commodity groups significant in the economy of the state.

These are cereal, fruit and vegetable, meat and poultry, and milk products. Through choice of electives and summer work experience students may strengthen their training in one or more of these areas. A graduate may choose a career with industry or government in quality control, product development, research, process supervision, enforcement and consumer protection, and teaching.

The human nutrition and foods curriculum is designed to prepare students for the professions of dietetics, positions as home economists in food-related organizations, and for research and graduate studies.

Six options of study are offered to men and women interested in careers related to food, nutrition and foodservice management. Students enrolled in these options complete prescribed courses of study leading to the degree of Bachelor of Science in Home Economics.

The Food-Related Business Option is for those interested in combining a career in business with foods. Courses in foods and nutrition, based on a foundation of chemistry and human physiology, are supplemented with appropriate business administration courses to prepare the graduate for entry-level positions in the food service industry or as representatives of equipment or utility companies, or other food-related organizations such as advertising agencies and in federal and local government programs.

The Food-Related Communications Option provides students with the opportunity to develop communications skills while studying the prescribed courses in general nutrition which are based on a foundation of chemistry and human physiology. Employment opportunities may be found in industry or government organizations engaged in the dissemination of food and nutrition information to the public.

The students enrolled in the Food-Related Communications Option may, by careful course selection, fulfill the requirements for a minor in communications. The minor will strengthen the student’s communications skills and enhance job opportunities.

Practicum experiences are available to students enrolled in the above options. For this experience, the student learns on the job for one semester or during the summer. Practicum experiences are arranged to match the career goals of the student.

General Dietetics is the "traditional" option in dietetics and has been available since the 1940s. By following the prescribed course of study of foods, nutrition and foodservice management based on chemistry, biochemistry, physiology and business the student fulfills the minimum academic requirements of The American Dietetic Association as well as those of the University and university. The student must gain additional clinical experience or training through a dietetic internship before becoming eligible for membership in The American Dietetic Association. Internships in hospitals or selected organizations are very competitive and are available mostly in the midwestern and eastern part of the United States. Those completing the program of study for a Bachelor of Science degree and an internship are qualified for a variety of positions as a member of a management team and/or health care team in hospitals; school, college, university food service; restaurants and in government and private agencies.

Completion of the Foodservice Management Option fulfills minimum academic requirements for membership in The American Dietetic Association, as well as those required by the department and university. Course work in chemistry, physiology, nutrition, foods, business and foodservice management are required. The graduate may become a member of The American Dietetic Association by completing an administrative internship. This person is then eligible for admnistrative positions in hospitals; school, college, and university food service; restaurants, as well as government and private agencies. These persons are not qualified to work in diet therapy or nutrition education positions.

The Coordinated Undergraduate Option in General Dietetics combines classroom education with clinical experiences in dietetics. Course work is similar to that described for general dietetics. In this four-year option, the student completes the academic requirements for the department and university as well as the eligibility requirements for membership in The American Dietetic Association and for taking the examination to become a Registered Dietitian. Graduates of this option qualify for the same kinds of positions as do the graduates of the General Dietetics Option who complete a baccalaureate internship.

To become a Registered Dietitian, it is necessary to complete one of the dietetic options and an internship for the General Dietetic and the Foodservice Management options. No internship is necessary after completing the Coordinated Undergraduate Option in General Dietetics. It is necessary to pass a registration examination which is given twice each year under the auspices of the Commission on Dietetic Registration. The dietitian meeting qualifications for registration is eligible to use the designation "R.D."

The sixth option in the department is the Research Option. The Research Option requires more science courses than the above options. Physics and biology, in addition to courses in chemistry, biochemistry, physiology, foods and nutrition, are required. Students may participate in research projects conducted by the faculty. This experience provides a general understanding of career possibilities and allows students to share in research accomplishments. Those persons graduating in the Research Option may obtain jobs in research, teaching, or food-related areas. The graduate of this option may become a laboratory technician. However, to become a leader in a research project, an advanced degree is usually required. The Research Option is excellent preparation for graduate study.

The department offers minors in Food Science, Nutrition and Foodservice Management.

The department offers study leading to the degree of Bachelor of Science in Food Science and Technology, Bachelor of Science in Home Economics, Master of Science in Food Science, Master of Science in Home Economics, and Doctor of Philosophy (Food Science). The department participates in interdisciplinary programs in nutrition leading to the degrees of Master of Science in Nutrition, and Doctor of Philosophy (Nutrition).

An accelerated program to obtain both a Bachelor of Science and a Master of Science degree in Home Economics within a five-year period is also offered.

Description of Courses
For explanation see Index under "Symbols"

Food Science
FASH
102 Animal Products 3 (2-3) Animal product industries, including classification, grading, handling, use and nutritional value.
170 Food for Mankind 2 Interrelationships between people and their food supply; broad coverage of contemporary food-related topics.
270 Food Selection and Appraisal 2 Qualities of food necessary for acceptability by the consumer; includes government and industry standards.
301 Dairy Products 2 (1-3) Prereq Micro 101 or 201; Org Chem. Specialized techniques and practices of dairy product manufacturing and marketing. Field trip required.
302 Meat and Poultry Products 3 (2-3) Prereq Micro 101 or 201; Org Chem. Specialized techniques and practices of meat, poultry, and egg processing and marketing. Field trip required.
303 Fruit and Vegetable Products 3 (2-3) Prereq Micro 101 or 201; Org Chem. Specialized techniques and practices of fruit and vegetable processing and marketing. Field trip required.
304 Cereal Products 2 Prereq Org Chem. Technical principles relating to the production and commercial processing of legume and cereal foods. Field trip required.
365 Quality Milk Production 2 Prereq one sem Bio S. Various factors affecting milk quality during production and methods of evaluation used in commercial practice. (a/y)
401 Topics in Food Science V 1-3 May be repeated for credit; cumulative maximum 6 hours. Selected topics in food science and technology. Credit not granted for both FSHN 401 and 501.
402 Seminar in Food Science 1 May be repeated for credit; cumulative maximum 2 hours. Current literature and special subjects.
416 Microbiology of Food 3 (2-3) Same as Micro 416. Joint listing with the University of Idaho (Bact ID402).
422 Food Quality Evaluation 3 (2-2) Prereq senior or graduate in FSHN. Techniques in evaluation of quality of foods by sensory and instrumental methods. Credit not granted for both FSHN 422 and 522. (a/y)

433 Agricultural Processing 3 Prereq Ag M 210 or Math 140; Phys 101. Principles of heat transfer, steam, air-vapor mixtures, refrigeration and fluid flow as applied to commodity processing and storage.

434 Food Engineering Laboratory 1 (0-3) Prereq FSHN 433 or c/c. Experiments in heat transfer, fluid flow and dehydration.

450 Food Fermentations 3 (2-3) Prereq microbiology; Org Chem. Principles and procedures of fermentation of fruits and vegetables, meat products, and dairy products. Credit not granted for both FSHN 450 and 550. (a/y)

460 Food Chemistry 3 Prereq Org Chem and Biochem. Fundamentals of food chemistry: composition of foods and the changes that occur during processing.

461 Food Chemistry Laboratory 1 (0-2) Prereq FSHN 460 or c/c. Experiments related to the properties, reactions, and interactions of chemical components of foods.

462 Food Analysis 4 (2-4) Prereq Chem 220, 222; one sem Micro. Introductory food analysis; methods common to many food commodities.

474 Advanced Food Technology 3 Prereq FSHN 416, 433 or c/c. Physical principles of food preservation and recent advances in food technology. Credit not granted for both FSHN 476 and 570.

487 Food Process Engineering 3 Same as Ag E 487. Credit not granted for both FSHN 487 and 587.

495 Internship in Food Science and Technology 2 May be repeated for credit; cumulative maximum 4 hours. Not open to freshmen. Students work full time in industrial assignments with prior approval of adviser and industrial supervisor.

499 Special Problems V 1-4 May be repeated for credit.

501 Topics in Food Science V 1-1 May be repeated for credit; cumulative maximum 6 hours. Graduate level counterpart of FSHN 401; additional requirements. Credit not granted for both FSHN 401 and 501.

508 Seminar—Written 1 May be repeated for credit. Development of skills in writing and reporting current food science research.

509 Seminar—Oral 1 May be repeated for credit. Development of skills and communication tools and techniques for oral presentations of current food science research.

510 Advanced Food Chemistry 3 Prereq Chem 364. Chemical, physical, and toxicological properties of water, vitamins, pigments, synthetic colors, minerals, miscellaneous food additives, and natural toxicants. (a/y)

511 Food Carbohydrates, Lipids, and Proteins 3 Prereq Chem 364. Occurrence, structure, properties, and functions of carbohydrates, lipids, and proteins in foods. (a/y)

522 Food Quality Evaluation 3 (2-2) Graduate level counterpart of FSHN 422; additional requirements. Credit not granted for both FSHN 422 and 522. (a/y)

550 Food Fermentations 3 (2-3) Graduate level counterpart of FSHN 450; additional requirements. Credit not granted for both FSHN 450 and 550.

570 Advanced Food Technology 3 Graduate level counterpart of FSHN 470; additional requirements. Credit not granted for both FSHN 470 and 570.

575 Qualifying Experience in Dietetics 8 or 16 May be repeated for credit; cumulative maximum 16 hours. By interview only. Supervised professional experiences in clinical, administrative and community dietetics for advanced degree candidates.

580 Physical Properties of Foods 2 Prereq Math 140, FSHN 433. Thermodynamics, rheology, thermal and mass transfer properties of foods as related to food processes and quality. (a/y)

587 Food Process Engineering 3 Same as Ag E 587. Graduate level counterpart of FSHN 487; additional requirements. Credit not granted for both FSHN 487 and 587.

600 Special Projects or Independent Study Variable credit

700 Master's Research, Thesis, and/or Examination Variable credit

800 Doctoral Research, Dissertation, and/or Examination Variable credit

Schedule of Studies

FOOD SCIENCE

The following schedules set forth the general requirements for the two departmental undergraduate options. General University Requirements are met in the department requirements listed for both options. Students are urged to consult their advisers for appropriate sequencing of courses as well as for the selection of electives that best suit their needs and interests. Illustrative programs are available from the department.

At least 40 of the total hours required for the bachelor's degree in these programs must be in upper-division courses.

A. Science Option

This option has been designed for the student who is interested in the science of food processing. Emphasis is placed on the scientific aspects of processing and offers more laboratory analyses experience.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSHN 170, 301, 302, 303, 304, 401, 416, 422, 433, 434, 450, 460, 461, 462, 470</td>
<td>Ag E 201, 350</td>
<td>37</td>
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<tr>
<td>Chem 105, 106, 107, 220, 222, 240</td>
<td>BC/CP 364</td>
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<tr>
<td>Bio S 103; Micro 201</td>
<td>Stat 412</td>
<td>9</td>
</tr>
<tr>
<td>A S 301 or FSHN 333</td>
<td>Engr 101; 201 or 301; 402; SpCom 102 or 302</td>
<td>3</td>
</tr>
<tr>
<td>Phys 101, 102</td>
<td>Math 140</td>
<td>12</td>
</tr>
<tr>
<td>Hum Electives</td>
<td>Soc Sci Elective</td>
<td>8</td>
</tr>
<tr>
<td>A S 101, Hort 200, or Agron 201</td>
<td>Electives</td>
<td>3</td>
</tr>
</tbody>
</table>

B. Business Option

This option has been developed for the student who wishes to take the business and management courses in addition to the basic food processing courses. (a/y)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSHN 170, 301, 302, 303, 304, 401, 416, 422, 433, 434, 450, 460, 461</td>
<td>Chem 101, 102, 240; BC/CP 364</td>
<td>30</td>
</tr>
<tr>
<td>Math 140, Phys 101</td>
<td>Bio S 103, Micro 201</td>
<td>15</td>
</tr>
<tr>
<td>Stat 412 or QMath 215</td>
<td>Ag E 201, 350, 360</td>
<td>8</td>
</tr>
</tbody>
</table>

FSHN 130, 233, 333 or A S 301 12
Engl 101; 201 or 301; 402; SpCom 6
Hum Electives 3
Soc Sci Elective 3
A S 101, Hort 302, or Agron 201 3
B Law 210, Actg 230, 231 or Cpl S 405; Psych 306 or Mgt 301 13
Electives 6

C. Recommended Electives

Food Production: A S 101, Hort 302; Agron 201.

Engineering: Math 171, 172, Phys 201, 202, C E 341, 342; Ch E 301, 302, 401, 402.


$Substitute for Math 140.
$Substitute for Phys 101, 102.
$Substitute for Chem 240.

Minor in Food Science and Technology

A minor requires a minimum of 16 semester hours, half of which must be in upper-division courses. Required courses: FSHN 416, 460, 461.

Preparation for Graduate Study

Students who plan to work toward an advanced degree should elect courses which will support their major area of interest or strengthen their major. Consultation with their adviser will be found most helpful.

Description of Courses

For explanation see Index under "Symbols"

Human Nutrition and Foods

120 Food Preparation 3 (2-2) Principles and methods of preparation, qualities, composition, and uses of foods. Credit not granted for both FSHN 120 and 220.

130 [B] Nutrition for Men 3 Nutrition principles and applications to nutrient needs at all age levels; psychological, economic, and cultural implications of food. Credit not granted for both FSHN 130 and 233.

220 Food Preparation 3 (2-3) Prereq Chem 240. Application of scientific principles in the use and preparation of selected standard quality food products. Credit not granted for both FSHN 120 and 220.

230 Foods and Cultures of African Peoples 3 Impacts of foods and cultures of African peoples on ethnic groups throughout the world.

233 Human Nutrition 3 Prereq one course in Chem. Principles of human nutrition applicable to all ages of human development; impact of environment, economics, culture on food and nutrition. Credit not granted for both FSHN 130 and 233.

266 Management of Home Equipment 3 (2-3) Management of equipment and utilities in the home.

280 Quantity Food Production 3 Prereq FSHN 120 or 220. Principles of menu writing, sanitation and food preparation applied to management of quantity food production and service.

281 Quantity Food Production Laboratory V 1 (0-3) or 2 (0-6) Prereq FSHN 120 or 220. Recipe adjustment and costing; preparing and serving food in quantity.

333 Nutrition in the Human Life Cycle 3 Prereq Chem 240; Zool 251. Influences of
334 Family Food Management 3 (2-3) Prereq: FSHN 120 or 220; a course in nutrition. Selection, purchase, preparation and serving foods; nutritional needs, life styles, and income levels.

350 Dynamics of Dietetics 2 (1-3) Prereq HNF major; cr. in HNF for CUOGD students. Dynamics of nutritional care and foodservice management in health and disease.

381 Quantity Food Purchasing 2 Prereq FSHN 280; 281 or 282. Purchasing process; specifications, receiving, storage, and inventory control.

403 Professional Perspectives 3 Same as AgHE 403.

420 Comparative Foods 2 Prereq Chem 240. Experimental foods taught by means of demonstrations; chemical and physical principles in the preparation of foods.

421 Comparative Foods Laboratory 1 (0-3) May be repeated for credit; cumulative maximum 2 hours. Prereq FSHN 420. Studies of food products reported through research paper or public demonstration.

422 Food Quality Evaluation 3 (2-3) Prereq senior or graduate in FSHN. Techniques in evaluation of quality of foods by sensory and instrumental methods. Credit not granted for both FSHN 422 and 522. (a/y)

430 Human Nutrition, Intermediary Metabolism 3 Prereq BC/BB 364; Zool 351. Biochemical roles of nutrients and processes of intermediary metabolism affecting man's need for food; recommended dietary allowances; national nutritional problems.

431 Prematual, Infant and Child Nutrition 2 Prereq FSHN 333 or c/f. Nutrition of the mother and fetus during pregnancy and of the child from infancy to adolescence. (a/y)

435 Diet Therapy 3 (2-3) Prereq FSHN 430 or c/f. Nutrition principles applied to pathological conditions in man.

436 Nutrition Education 3 Prereq FSHN 333. Individual and group nutrition education programs; methods, resources, settings, and community structures for guiding change in nutritional behavior.

438 Readings in Foods and Food Systems Management 2 Prereq FSHN 480 or c/f. Reports, discussions and reviews of recent scientific literature and developments in foods and food systems management. Credit not granted for both FSHN 438 and 458.

439 Current Topics in Nutrition 2 Prereq FSHN 430. Analysis of scientific, popular and legislative articles pertaining to topics of current interest in nutrition. Credit not granted for both FSHN 439 and 539.

440 Clinical Dietetics 3 By interview only. Advanced nutrition principles applied to pathological conditions in humans and principles of participation in delivery of nutritional care.

475 Clinical Experience in Dietetics V 1-5 May be repeated for credit; cumulative maximum 20 hours. By interview only. Students in CUOGD receive clinical experience each semester during their junior and senior years.

480 Organization and Management of Food Service Systems 3 Prereq FSHN 280; for seniors only. Organization and management principles as applied to food.

481 Dietetics/Management Practicum V 3 (1-6) to 6 (1-15) May be repeated for credit; cumulative maximum 6 hours. Prereq senior in FSHN. Application of theory in assessing, implementing, and evaluating dietary and management practices. Credit not granted for both FSHN 481 and 498.

482 Equipment for Food Service Systems 3 Prereq FSHN 280, 281. Materials, specifications, operations and use, maintenance schedules of kitchen equipment, dining room facilities and equipment flow. (a/y)

484 Computer-Assisted Dietary Management 3 Prereq FSHN 480 or c/f. Use of computer programs to aid management in inventory control, production, food cost accounting and patient nutrient analysis.

485 Clinical Experience in Food Service Systems 3 (1-6) By interview only. Experience in food systems management in clinical settings.

498 Food Practicum V I (0-3) to 8 (0-24) May be repeated for credit; cumulative maximum 8 hours. Not open to freshmen and sophomores. Supervised experiences of working in one or more food related businesses, organizations, and agencies. Credit not granted for both FSHN 481 and 498.

503 Advanced Human Nutrition I 3 Prereq FSHN 430. Experimental basis for human nutritional requirements and determination of nutritional status.

504 Advanced Human Nutrition II 3 Prereq FSHN 503. Metabolic responses to foods with emphasis on neutral and hormonal responses; interaction of nutrients at the whole body level.

521 Research Techniques in Nutrition 3 (1-6) Prereq 6 hrs nutrition. Methods of conducting field, applied and metabolic studies in human nutrition.

522 Food Quality Evaluation 3 (2-3) Graduate level counterpart of FSHN 422; additional requirements. Credit not granted for both FSHN 422 and 522. (a/y)

525 Changing Food Patterns 2 or 3 Prereq FSHN 334; 8 hrs social science; Zool 251 or Chem 240. Interrelationships of food behavior and nutrition; implications for teaching and development of instructional plans.

526 Community Nutrition 3 Prereq adv nutrition course. By interview only. Analysis and evaluation of community nutrition programs; planning, surveillance and intervention; community resources, agencies and institutions for nutrition.

530 International Nutrition 3 Prereq adv nutrition course. World nutrition, cultural, and economic problems related to meeting nutritional needs.

531 Nutrition and Aging 2 or 3 Prereq adv nutrition course. By interview only. Assessment, evaluation, and treatment of nutritional problems of the aged.

532 Human Digestion and Absorption 3 Prereq BC/BB 364; FSHN 430. Pathological biochemistry, anatomy, and physiology of digestion and absorption in human gut. (a/y)

533 Pathophysiology of Human Nutrition 3 Prereq Zool 353; BC/BB 364; FSHN 435. Protein, fat, carbohydrate and other nutrient pathophysiology in the human.

536 Nutrition Program Theory and Practice 3 (2-3) Prereq FSHN 436. Societal and behavioral determinants of foods habits; application and implementation of planning and evaluation principles to nutrition education programs.

538 Readings in Foods and Food Systems Management 2 Graduate level counterpart of FSHN 438; additional requirements. Credit not granted for both FSHN 438 and 538.

539 Current Topics in Nutrition 2 Graduate level counterpart of FSHN 439; additional requirements. Credit not granted for both FSHN 439 and 539.

575 Qualifying Experience in Dietetics 8 or 16 May be repeated for credit; cumulative maximum 16 hours. By interview only. Supervised professional experience in clinical, administrative, and community dietetics for advanced degree candidates. Meets ADA requirements for qualifying experience.

Problems, Research, and Thesis

FSHN 499 Special Problems V 1-4 May be repeated for credit.

598 Foods/Nutrition Practicum V I (0-3) to 4 (0-12) May be repeated for credit; cumulative maximum 4 hours. By interview only. Professional level supervised field experience in food and/or nutrition.

600 Special Projects or Independent Study Variable credit.

701 Master's Research, Thesis, and/or Examination Variable credit. (For master's in H E or nutrition only.)

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit. (For PhD in nutrition only.)

Schedule of Studies

**HUMAN NUTRITION AND FOODS**

The Bachelor of Science in Home Economics requires a total of 120 semester hours. At least 40 of the total hours required for the Bachelor of Science degree must be in upper-division courses. All students in the major are required to take General University Requirements, Department Core Courses, and the courses listed for the specific option. First semester freshmen should enroll in chemistry (see specific option).

A. **General University Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts and Humanities</td>
<td>6</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>3</td>
</tr>
<tr>
<td>Econ 201</td>
<td>4</td>
</tr>
<tr>
<td>Psych 105 or Soc 101*</td>
<td>3</td>
</tr>
<tr>
<td>Intercultural Studies</td>
<td>3</td>
</tr>
<tr>
<td>Anth 309, Ch St 110, or Am 101*</td>
<td>3</td>
</tr>
<tr>
<td>Communications Proficiency*</td>
<td>6</td>
</tr>
<tr>
<td>Chemistry*</td>
<td>8</td>
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<tr>
<td>Zool 251</td>
<td>4</td>
</tr>
</tbody>
</table>

*See specific option.

B. **College Core Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>FSHN 130 or 233; 403</td>
<td>6</td>
</tr>
<tr>
<td>CPS 240 or 247</td>
<td>3</td>
</tr>
<tr>
<td>1 D 101 or 202</td>
<td>3</td>
</tr>
</tbody>
</table>

C. **Department Core Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem 240 Elem Organic Chem</td>
<td>4</td>
</tr>
<tr>
<td>FSHN 220 Food Prep</td>
<td>3</td>
</tr>
<tr>
<td>FSHN 233 Human Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>FSHN 280 Quan Fd Prod</td>
<td>3</td>
</tr>
<tr>
<td>FSHN 281 Quant Lab</td>
<td>1-2</td>
</tr>
<tr>
<td>FSHN 333 Nutr Human Life Cycle</td>
<td>3</td>
</tr>
<tr>
<td>FSHN 334 Pan Food Mgt</td>
<td>3</td>
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</tbody>
</table>
D. Department Option

1. Food-Related Business Option

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Chem 101, 102 Introductory</td>
<td>8</td>
</tr>
<tr>
<td>Micro 101 Elem Bact</td>
<td>4</td>
</tr>
<tr>
<td>Soc 101 or Psych 105</td>
<td>3</td>
</tr>
<tr>
<td>SpCom 102 Pub Speaking</td>
<td>3</td>
</tr>
<tr>
<td>FSHN 266 Mgmt Home Eq</td>
<td>3</td>
</tr>
<tr>
<td>FSHN 270 Food Sel &amp; App</td>
<td>2</td>
</tr>
<tr>
<td>FSHN 420 Comp Foods</td>
<td>2</td>
</tr>
<tr>
<td>FSHN 438 Readings</td>
<td>2-3</td>
</tr>
<tr>
<td>FSHN 498 Food Practicum (301, 302, 303, 304)</td>
<td>2-5</td>
</tr>
<tr>
<td>Mgt 301 Mgmt &amp; Org</td>
<td>3</td>
</tr>
<tr>
<td>Mtkt 350 Marketing</td>
<td>3</td>
</tr>
<tr>
<td>SpCom 301, AgHE 205, or SpCom 235</td>
<td>3</td>
</tr>
<tr>
<td>CFS 352 Fam as Consumers</td>
<td>3</td>
</tr>
<tr>
<td>Mtkt 367 or CFS 350</td>
<td>3</td>
</tr>
<tr>
<td>Jour 225 or Engl 402</td>
<td>3</td>
</tr>
</tbody>
</table>

Plus a minimum of 15 credits selected from: Anth 203; B Law 210; Acctg 230; Mgt 401; Adver 280; Pr 413; El/Se 301, 445; FSHN 421, 422, 430, 436; Psych 306; Soc 351 or 373; statistics or computer science.

2. Food-Related Communications Option* or Minor**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem 101, 102</td>
<td>8</td>
</tr>
<tr>
<td>Micro 101 Elem Bact</td>
<td>4</td>
</tr>
<tr>
<td>Psych 105 or Soc 101</td>
<td>3</td>
</tr>
<tr>
<td>FSHN Products Course (301, 302, 303, 304)</td>
<td>2-5</td>
</tr>
<tr>
<td>Mtkt 365 Marketing</td>
<td>3</td>
</tr>
<tr>
<td>Com 225 Newwriting</td>
<td>3</td>
</tr>
<tr>
<td>Jour 305 Reporting</td>
<td>3</td>
</tr>
<tr>
<td>Bdust 255 Intro Broadcasting</td>
<td>3</td>
</tr>
<tr>
<td>Adver 280 Adver Prin &amp; Pract</td>
<td>3</td>
</tr>
<tr>
<td>P R 312 Public Relations</td>
<td>3</td>
</tr>
<tr>
<td>Jour 330 News Editing</td>
<td>3</td>
</tr>
<tr>
<td>P R 413 Public Info</td>
<td>3</td>
</tr>
<tr>
<td>FSHN 266 Mgmt Home Eq</td>
<td>3</td>
</tr>
<tr>
<td>FSHN 270 Food Sel &amp; App</td>
<td>2</td>
</tr>
<tr>
<td>FSHN 420, 421 Comp Foods</td>
<td>2-3</td>
</tr>
<tr>
<td>FSHN 438 or 439</td>
<td>2-3</td>
</tr>
<tr>
<td>FSHN 498 Food Practicum</td>
<td>1-8</td>
</tr>
</tbody>
</table>

*For an option the student should select at least 12 credits from the listed communications courses.

**For a minor all of the listed communications courses must be taken.

3. General Dietetics Option

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Chem 105, 106, 107</td>
<td>8</td>
</tr>
<tr>
<td>Micro 101 Elem Bact</td>
<td>4</td>
</tr>
<tr>
<td>Psych 105 or Soc 101</td>
<td>3</td>
</tr>
<tr>
<td>Math 101 Inter Algebra</td>
<td>4</td>
</tr>
<tr>
<td>BC/BD 364, 366</td>
<td>4</td>
</tr>
<tr>
<td>Mgt 301 Mgt &amp; Org</td>
<td>3</td>
</tr>
<tr>
<td>FSHN 270 Food Sel &amp; App</td>
<td>2</td>
</tr>
<tr>
<td>FSHN 381 Quant Fd Phys</td>
<td>2</td>
</tr>
<tr>
<td>FSHN 420 Comp Foods</td>
<td>2</td>
</tr>
<tr>
<td>FSHN 430 Hum Nut</td>
<td>3</td>
</tr>
<tr>
<td>FSHN 435 Diet Therapy</td>
<td>3</td>
</tr>
<tr>
<td>FSHN 436 or El/Se 301</td>
<td>3-4</td>
</tr>
<tr>
<td>FSHN 438 or 439</td>
<td>2</td>
</tr>
<tr>
<td>FSHN 480 Mgt Fd Sys</td>
<td>3</td>
</tr>
<tr>
<td>FSHN 481 Dietetics/Mgt</td>
<td>3-6</td>
</tr>
<tr>
<td>FSHN 484 Cpt Diet Mgt</td>
<td>3</td>
</tr>
</tbody>
</table>

An elective course may be substituted if the Mathematics Achievement Score on Washington Pre-College Test is greater than 56.

4. Foodservice Management Option

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem 101, 102</td>
<td>8</td>
</tr>
<tr>
<td>Micro 101 Elem Bact</td>
<td>4</td>
</tr>
</tbody>
</table>

Students who identify an interest in graduate work early in their studies are encouraged to participate in an accelerated course of study in which both a BS and MS can be earned in five years. A student should 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.

Department of Foreign Languages and Literatures

Associate Professor and Department Head, J. T. Brewer; Professors, A. Chang, H. C. Kim, W. A. Luchting; Associate Professors, P. W. Blackwell, A. Centner, E. R. Gonzalez, E. Hartman, B. M. Ingemanson, C. J. Kenlen, J. Labat, M. M. Mat- terson, G. S. Mazur, L. A. Shephard, B. R. Weaver; Assistant Professors, C. Carlin, B. Frederick, R. D. De Blanc; Lecturer and Director of the Language Laboratories, B. A. Johnson.

Knowledge of languages in addition to English is essential in the modern world of rapid communication, international business, and multinational ventures in science and technology. The Department of Foreign Languages and Literatures attempts to help students prepare themselves for full participation in the world community by offering a wide range of classes in language, literature, and culture.

Courses are offered regularly in Chinese, Danish, Greek, Japanese, and Latin. Majors are available in French, German, Russian, and Spanish. Languages such as Hindi, Sanskrit, and others may be offered as warranted by student interest and staff available.

The department's curriculum is structured to allow entry on any level. Students who begin language study in the public schools or at another institution may continue here at their level of competence without loss of time. Specifically, the courses in this department serve several purposes. They (1) enable students to gain proficiency in their target language and to appreciate the literature and culture of that language; (2) give language training for careers which require it; (3) provide a continuing service to students of other departments by helping them to learn to read foreign publications in their fields of interest; and (4) prepare future foreign language teachers.

Two modern language laboratories are available for individual use by students with their own tapes or departmental tapes.

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 maison francaise, a living group where only French is spoken and where conversational activities are supervised by a resident native speaker, is open to students of both a sophomore standing and above. Visiting lecturers, foreign film showings, and performances of plays by professional companies from abroad as well as by WSU foreign language students supplement the classroom experience.

Departmental scholarship funds provide foreign language majors either with scholarships covering tuition and fees or smaller scholarships. They are awarded annually, to qualified majors of junior or senior standing.

The department offers courses of study leading to the degrees of Bachelor of Arts in Foreign Languages and Literatures and Master of Arts in
Department of Foreign Languages and Literatures

Foreign Languages and Literatures. The department also participates in the interdepartmental Program in Literary Studies leading to the degree of Doctor of Philosophy.

Description of Courses

For explanation see Index under "Symbols"

Foreign Language

For L

101 Elementary Danish 4 Introduction to Danish facilitating fluency and reading ability through varied materials and practical grammar coverage through written drills.1

102 Second Semester Danish 4 Prereq For L 101. Intermediate Danish; speaking, writing, and understanding Danish on a more advanced level.2

270 [K] Introduction to South Asian Culture 3 Same as Hist 270.3

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.4

303 Elementary Hindi 4 Basic structure; reading and conversational skills; core vocabulary.5

304 Elementary Hindi 4 Prereq For L 303. Continuation of For L 303.6

310 [C] Eastern Civilization and Literature 3 The development of eastern civilization as expressed through literary and cultural aspects.7

324 Methods of Teaching Foreign Languages 3 Prereq 2 yrs foreign language.

350 Speech, Thought, and Culture 3 Same as Anth 350.

352 Gandhi and 20th Century India 3 20th century India; Gandhi, his concepts, impacts, contemporary relevance; independence, the Nehru era and after.

426 Applications of Linguistics to the Teaching of Foreign Languages 3 Prereq 304 language course. Contemporary linguistic principles applied to the teaching of foreign languages.8

450 Descriptive Linguistics 3 Same as Anth 450.

499 Special Problems V 1-4 May be repeated for credit.

505 Topics in Comparative Literature 3 May be repeated for credit; cumulative maximum 6 hours. Comparative approach to selected literary topics.

591 Seminar in Literary Studies 3 Same as Engl 591.

597 Seminar in Scholarly Methodology 2 Bibliography and formal aspects of scholarly writing; general introduction to literary criticism.

598 Instructional Practicum 1 Analysis and practical application of foreign language methodologies.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit. (for PhD in literary studies only)

Chinese

Chin

301 First Semester 4 Fundamentals of speaking, reading, and writing.9

302 Second Semester 4 Prereq Chin 301. Continuation of Chin 301.10

303 Intensive Chinese 10 (S-15) Provides practice in listening to, speaking, reading, and writing Chinese. For students with little or no experience in Chinese. Open to undergraduate and graduate students.11

305 [H] Classical Chinese 3 Grammar and Latin classics in English translation: reading, discussion, classroom essays, lectures.

French

Fren

101 First Semester French 4 Elementary French; understanding and speaking.12

102 Second Semester French 4 Prereq Fren 101.13

103 Second Semester French 4 Prereq Fren 101.14

105 Third Semester French 4 Prereq Fren 102. Intermediate French; systematic grammar review and development of all skills.15

107 Intensive French 10 (S-15) Provides practice in understanding, speaking, reading, and writing French. For students with little or no experience in French. Open to undergraduate and graduate students.16

109 French Civilization I 3 Early Period: 3 Readings, lectures, and discussions in English. Cultural and social trends in France from ancient times to 1715.17

110 French Civilization II 3 Modern Period: 3 Readings, lectures, and discussions in English. Cultural and social trends in France from 1715 to the present.18

111 Topics in French Civilization 3 Study Abroad (Avignon).19

322 French Composition 3 Prereq Fren 304. Systematic practice in writing French.20

323 French Conversation 3 Prereq Fren 304. Systematic practice in speaking French.21

325 [H] Survey of French Literature to 1700 3 Prereq Fren 304. Transitional course shifting emphasis from language to literature.22

326 [H] Survey of French Literature After 1700 3 Prereq Fren 304.23

350 French Literature in English 2 May be repeated for credit. Lectures and readings in English of selected topics and writers.

351 Advanced French Conversation 3 Prereq Fren 322 or 323. Intensive oral practice in small groups.24

416 Seminar in French Civilization 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Fren 322, 323, 333, or 334.25

421 French Literature of the 17th Century 3 Prereq Fren 322, 323, or 333. Selected works and authors; the classical period. (a/y)

422 Advanced French Grammar and Syntax 2 Prereq Fren 322 or 323. Fluency and accuracy in written and oral expression. (a/y)

423 Pronunciation and Phonetics 2 Prereq Fren 322 or 323. A practical approach to French phonetics; pronunciation and dictation; special problems.

431 French Literature of the 18th Century 3 Prereq Fren 322, 323, or 334. French Enlightenment; selected writings of Montesquieu, Voltaire, Diderot, Rousseau, and others. (a/y)

441 French Literature of the 19th Century 3 Prereq Fren 322, 323, or 334. Authors and movements of the century; the Romantic, Symbolist, and Naturalist prose writers.

451 French Literature of the 20th Century 3 Prereq Fren 322, 323, or 334. Authors and movements from the early 1900's to 1930; Gide, Proust, Generation of 1920; neosymbolism and existentialism; modern criticism and essays. (a/y)

480 Seminar in French Language or Literature 3 May be repeated for credit. Prereq Fren 322, 323, 333, or 334.

499 Special Problems V 1-4 May be repeated for credit.

501 Seminar in Medieval or 16th Century French Literature 3 May be repeated for credit; cumulative maximum 6 hours. Selected works from the earliest texts to 1500, or Renaissance authors. (a/y)

521 Seminar in 17th or 18th Century French Literature 3 May be repeated for credit; cumulative maximum 6 hours. Selected works from the 17th and 18th centuries. (a/y)

522 Special Topics 2 May be repeated for credit; cumulative maximum 6 hours. Selected works from the 19th century. (a/y)

580 Graduate Seminar 3 May be repeated for credit.

598 Instructional Practicum 1 May be repeated for credit; cumulative maximum 4 hours. Responsibilities, grading, instructional methods, and materials.

600 Special Projects or Independent Study Variable credit.

German

Ger

101 First Semester German 4 Fundamentals of speaking, reading, and writing.26

102 Second Semester German 4 Prereq Ger 101.27

303 Third Semester German 4 Prereq Ger 102. Cultural readings and expansion of grammatical concepts.28

1Not open to native speakers.
304 Intermediate German 4 Prereq Ger 203. Selected German texts in a cultural context; continued practice in spoken and written German.1

315 Germanic Civilization 3 The cultural development of the Germanic peoples to 1750; readings, lectures, and discussions in English.

316 German Culture and Civilization 3 The cultural development of Germany from 1750 to the present; readings, lectures, and discussions in English.

317 Contemporary Culture and Society 3 Lectures, readings, and discussions in English; current social, political, economic, and cultural trends in Germany.

318 Topics in German Civilization 3 Study Abroad (Cologne).

322 Composition and Conversation 3 Prereq Ger 304. Intensive practice in speaking and writing formal German.1

323 Composition and Conversation 3 Prereq Ger 304. Continuation of intensive practice in conversation and formal writing skills.1

331 Introduction to German Literature 3 Prereq Ger 304. Transitional course shifting emphasis from Duregg as such to literature.

334 [H] The German Novelle 3 Prereq Ger 304.

350 German Literature in English 2 May be repeated for credit. Readings, lectures, and discussions in English of selected topics and writers.

401 Informal German Conversation 1 May be repeated for credit; cumulative maximum 4 hours. Prereq Ger 304. Intensive oral practice in small groups.1

420 Advanced Composition and Conversation 3 Prereq Ger 322 or 323. Development of proficiency in writing skills; emphasis on fluency and accuracy.

432 German Literature of the Enlightenment and Storm and Stress 3 Prereq Ger 304. The works of Lessing, young Goethe, young Schiller, and others.

433 The German Classical Period 3 Prereq Ger 304. Reading from the later works of Goethe, Schiller, and others. (a/y)

442 German Drama of the 19th Century 3 Prereq Ger 304. The works of Kleist, Buchner, Hebbel, Grillparzer, and others.

451 German Literature from 1800 to First World War 3 Prereq Ger 304. The works of Hauptmann, Hofmannsthal, Kafka, Mann, and Rilke, and others.

452 German Literature from the First World War to the Present 3 Prereq Ger 304. The works of Hesse, Mann, Brecht, Zuckmayer, Grass, Durrenmatt, Frisch, and others.

480 Seminar in German Language or Literatures 3 May be repeated for credit. Prereq Ger 304.

499 Special Problems V 1-4 May be repeated for credit.

521 Syntax and Stylistics 2 Advanced composition; development of German prose style. (a/y)

523 History of the German Language 3 Phonological, morphological, semantic, and syntactic development of German from the earliest time to present. (a/y)

540 Goethe 3 A comprehensive examination of Goethe’s life and works.

543 German Romantic Movement 3 Literary, aesthetic, and philisophic writings of the Romantic period. (a/y)

580 Graduate Seminar in German Language and Literature 3 May be repeated for credit.

598 Instructional Practicum 1 May be repeated for credit; cumulative maximum 4 hours. Responsibilities, grading, instructional methods and materials.

600 Special Projects or Independent Study Variable credit.

Hindi

For L

303 Elementary Hindi 4 Basic structure; reading and conversational skills; core vocabulary.1

304 Elementary Hindi 4 Prereq For L 303. Continuation of For L 303.1 (a/y)

Italian

Ital

101 First Semester Italian 4 Fundamental principles of Italian; the spoken language.1

102 Second Semester Italian 4 Prereq Ital 101. Continuation of Ital 101.1

Japanese

Jpn

301 Japanese I 4 Fundamentals of speaking, reading, and writing.1

302 Japanese II 4 Prereq Jpn 301. Continuation of Jpn 301.1

303 Intensive Japanese 10 (5-15) Provides practice in listening to, speaking, reading, and writing Japanese. For students with little or no experience in Japanese. Open to undergraduate and graduate students. (SS)1

401 Japanese III 4 Prereq Jpn 302. Conversation and reading of selected texts.1

Russian

Rus

101 First Semester Russian 4 Fundamentals of speaking, reading, and writing Russian.1

102 Second Semester Russian 4 Prereq Rus 101. Continued development of basic skills in speaking, reading, and writing Russian.1

203 Third Semester Russian 4 Prereq Rus 102. Grammar review and further development of speaking, reading, and writing skills.1

303 Intensive Russian 10 (5-15) Provides practice in understanding, speaking, reading, and writing Russian. For students with little or no experience in Russian. Open to undergraduate and graduate students. (SS)1

304 Intermediate Russian 4 Prereq Rus 203. Reading and discussion of selected texts in their cultural context; brief grammar review. Continued practice in spoken and written Russian.1

315 Russian Civilization 3 Russian culture to 1917; readings, lectures, and discussions in English.

317 [G] Contemporary Soviet Culture and Society 3 Readings, lectures, and discussions in English; current cultural and social trends in the USSR.1

320 Russian Conversation I 2 Prereq Rus 304. Practice to improve oral skills.1

321 Russian Conversation II 2 (0-6) Prereq Rus 304.1

350 Russian Literature in Translation 3 May be repeated for credit; cumulative maximum 6 hours. Major works in Russian literature, both 19th century and the Soviet period; in English.

351 [G] Masterpieces of Russian Literature 3 The masterpieces of the great Russian writers of the 19th and 20th centuries.1

380 Seminar in Russian Language 3 May be repeated for credit; cumulative maximum 6 hours. Application and elaboration of the basic syntactic and stylistic principles of the language. Taught in Russian.

471 Russian Literature of the Soviet Period 3 Prereq Rus 304. Selected works written after 1917. Taught in Russian.

480 Seminar in Russian Literature 3 May be repeated for credit; cumulative maximum 6 hours. Selected works from the 19th and 20th centuries. Taught in Russian.

490 Seminar: Research Topics V 1-3 May be repeated for credit; cumulative maximum 6 hours. Directed research with in-class discussion.

499 Special Problems V 1-4 May be repeated for credit.

600 Special Projects or Independent Study Variable credit.

Spanish

Span

101 First Semester Spanish 41

102 Second Semester Spanish 4 Prereq Span 101.1

198 Beginning Spanish Honors 4 Prereq language aptitude test. Spanish language skills and cultural appreciation of Spanish speaking people.

203 Third Semester Spanish 4 Prereq Span 102.1

303 Intensive Spanish 10 (5-15) Provides practice in listening to, speaking, reading, and writing Spanish. For students with little or no experience in Spanish. Open to undergraduate and graduate students.1 (SS)

310 Introduction to Advanced Spanish Studies 4 Prereq Span 203. Reading and discussion of selected Spanish texts in a cultural context; brief grammar review.

310 Business in the Spanish World 3 Prereq Span 304. Spanish business vocabulary, cultural vignettes, and business activities.

315 Hispanic Civilization 3 Spanish culture with lectures and reading in English.

316 Latin American Civilization 3 Prereq Span 304. Social, political, and cultural issues as seen through literature. Taught in English.

318 Topics in Latin American Civilization 3 Study Abroad (Guadalajara).

320 Spanish Conversation 1 (0-3) May be repeated for credit; cumulative maximum 4 hours. Prereq Span 304. Opportunity to converse in small groups with native informants.1

321 Pronunciation of Spanish 1 (0-3) Prereq Span 203. Pronunciation of Spanish sounds.

322 Advanced Grammar 2 Prereq Span 304. Recommended for those intending to take the upper-level composition or conversation courses.1

323 Oral Spanish 2 Prereq Span 304. Practice in the use of conversational Spanish in formal and informal contexts.1

324 Spanish for Spanish Speakers I 3 Prereq fluency in Spanish. Teachings of Chicano and Mexican writers; popular culture, composition, grammar, indicative mood and vocabulary.

326 Spanish Composition 2 Prereq Span 304. The writing of formal and informal Spanish.1

330 Advanced Intensive Spanish for Undergraduate Students 6 (3-9) Prereq Span 303. Continuation of Span 303.1 (SS)

1Not open to native speakers.
333 Masterpieces of Spanish and Spanish-American Literature 3 Prereq Span 304. Reading and discussion of outstanding literary works of Spanish and Spanish-American literature.

346 Vanguard Poetics in Chicano/Latino Writers 3 Same as Ch St 346.

350 [I] Masterpieces of Spanish American Literature in English 3 Lectures and reading of works by Borges, Garcia Marquez, Fuentes, and Vargas Llosa in English translation.

422 Seminar in Literature of Spanish Golden Age 3 Prereq Span 304. Aesthetic value and main characteristics of Spanish baroque period, as presented in the theatre.

423 Advanced Conversational Spanish 2 Prereq Span 323. Practice of the use of conversational Spanish in formal and informal contexts. 1

425 Seminar in Cervantes 3 Prereq Span 304. Quixote plus selected other works.

426 Advanced Spanish Composition 2 Prereq Span 326. Writing of formal and informal Spanish. 1

442 Spanish Literature of the 19th Century 3 Prereq Span 304. Drama, poetry, the short story, the costumbre sketch, and novella in 19th century Spain.

450 The Generation of 1898 and Modernism 3 Prereq Span 304. Reading and discussion of representative works by Peninsular writers of the early 20th century.

451 Spanish Literature Since 1920 3 Prereq Span 304.

471 19th Century Spanish American Literature 3 Prereq Span 304. Selected readings from independence to modernism.

472 Spanish-American Literature of the 20th Century 3 Prereq Span 304. Selections for the drama, poetry, the essay and the short story.


480 Seminar in Spanish Language or Literature 3 May be repeated for credit. Prereq Span 304.

499 Special Problems V 1-4 May be repeated for credit.

500 Seminar in Golden Age Literature 3 Prereq Span 304. Reading and discussion of representative works of the Spanish Golden Age.

501 Medieval Spanish Literature 3 Prereq Span 304. Important works of medieval Spanish literature. (a/y)

524 History of the Spanish Language 3 Prereq Span 304. Development of the Spanish language from the beginning to the present. (a/y)

530 Advanced Intensive Spanish for Graduate Students 6 (3-3-0) Continuation of Span 303. (SS)


580 Graduate Seminar 3 May be repeated for credit. Prereq Span 304.

598 Instructional Practicum 1 May be repeated for credit; cumulative maximum 4 hours. Responsibilities, grading, instructional methods and materials.

600 Special Projects or Independent Study Variable credit.

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**Swedish**

Swed 350 Scandinavian Literature in English 2 May be repeated for credit. Scandinavian literature from Ibsen, Strindberg, and Brandes to the present.

**Schedule of Studies**

At least 40 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

A minimum of 26 hours (beyond 203-level) or the equivalent in competence in the major language is required for a Bachelor of Arts degree in Foreign Languages and Literatures. In addition, each major must present either (1) competence in a second foreign language, up to and including 304 or the equivalent, (2) related work from another field or a teaching minor, or (3) a second major in another field.

In the junior and senior years students should take from 2 to 8 hours in their major language each semester as their individual program requires.

**Minimal Requirements for Each Major**

French: 304, 322, 323, 333, 334, 423, plus 8 hours from 315 or 316, 401 (maximum 2 hrs), 405, 416, 421, 422, 431, 441, 442, 451, 452, 480.

German: 304, 315; 2 courses from 322, 323, 420, 334, plus 11 hours from 316, 317, 401 (maximum 1 hr), 432, 433, 442, 451, 452, 480. Eight hours of these 11 must be in courses taught in German.


**Minimal Requirements for Each Minor**

To fulfill requirements for a minor in Foreign Languages and Literatures, a student must present a minimum of 16 hours of course work in one language area, of which a minimum of 6 hours above the 304-level (or its equivalent) must be taken in residence; these 6 hours must include at least 3 hours in the target language. Upper-division courses taken pass/fail may not be included for credit toward the minor.

Minor in Danish, Chinese, or Japanese

The student must earn a minimum of 16 total hours in the language area, which may include credit for advanced standing or transfer credit of courses through 304. Six hours of the course work in the language area above the 304 level must be taken in residence. These 6 hours must include at least 3 credit hours in the target language. Upper-division courses (300 and above) graded P/F may not be included for credit toward the minor.

Since advanced courses in Danish, Chinese, and Japanese are taught under For L 300, the student is required to obtain written certification from the instructor that 6 hours of course work is above the 304 level.

**Minor in Russian Area Studies—20 hours**

Required courses: Rus 101, 102; Hist 462, Rus 315 Soviet Option: Rus 101, 102; Hist 463; Rus 317 or Pol S 412

Electives: Hist 412, 465; Pol S 333, 426; Rus 350

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**AREA STUDIES**

The area studies curriculum (Latin America, Western European, and Eastern European Studies) permits students interested in a particular region of the world to follow a course of study concentrating on the language, literature, history, politics, geography, economics, and general culture of that area.

The International Business area studies curriculum combines a major in foreign languages with core courses in business. Complete details are available from the department. Through careful choice of electives and of courses meeting General University Requirements, a student may obtain sufficient concentration to prepare for graduate study in several fields or to enhance a wide variety of career possibilities.

**TEACHER-TRAINING PROGRAM**

Students preparing to teach should consult the catalog listing of the Department of Elementary and Secondary Education 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.

**INTENSIVE COURSES**

To meet the specific needs of those students who wish to achieve a degree of fluency within a brief time period, the department offers highly successful intensive courses in Chinese, French, German, Japanese, Russian, and Spanish each summer. Students devote eight hours per day, five days a week, for a period of eight weeks to formal language instruction.

**Preparation for Graduate Study**

Students who contemplate graduate work in the Department of Foreign Languages and Literatures should present an undergraduate degree similar to those described in the above schedule of studies. Complete details on graduate programs are available from the chair of the department.

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**Department of Forestry and Range Management**


The department offers programs in forest management, range management, and wildlife recreation leading to the degrees of Bachelor of Science in Forest Management, Bachelor of Science in Range Management, Bachelor of Science in Wildlife and Wildland Recreation Management, and Master of Science in Forest and Range Management.

The department also participates in interdepartmental programs leading to the degrees of Bachelor of Science in Environmental Science and Master of Science in Environmental Science.
Bachelor's Program

The undergraduate programs are designed to provide students with a basic understanding of the principles of forest management, range management, or wildland recreation. Within a broad natural resource area, a student can choose to concentrate on resource management, the sciences, or with the approval of the advisor and department chair, develop an individualized academic program that will enable the student to meet her/his academic goals.

The programs leading to the Bachelor of Science in Forest Science and the Bachelor of Science in Range Management are accredited by the Society of American Foresters and Society for Range Management, respectively. The department is the only department in the nation that is accredited by both professional societies. The forest management and range management curricula provide students with an opportunity to meet the U.S. Office of Personnel Management requirements for professional forester or range conservationist.

The options in the forest management and range management programs include management, science, wildlife habitat, and directed studies. In addition, a management program has a range livestock production option and the forest management program has a forest business option. The management option is designed to provide students with a basic understanding of the underlying sciences and management principles of their profession. The science option provides students interested in graduate study with a more thorough background in the sciences. The wildlife habitat option is designed to provide foresters and range managers with understanding and appreciation of the habitat needs of wildlife and problems associated with integrated forest and range management. The directed studies option provides students with an opportunity to develop professional programs that meet individual career goals and interdisciplinary programs such as combining a bachelor's degree in forest management with a minor in computer science or journalism. Similarly, forest and wildlife personnel teaches students with a required introduction to forestry and business, an effort to better prepare students for employment in forest management and marketing in the private sector or in other organizations which are profit oriented. The range livestock production option integrates animal science and range management principles and practices into a unified program.

The wildland recreation program options include forestry, state parks, interpretation, dispersed recreation, and directed studies.

The forestry option includes those forestry courses required by the U.S. Office of Personnel Management to meet professional forester requirements under Announcement 460. Those desiring employment with the U.S. Forest Service as a recreation manager or planner should meet these professional forester requirements. The state parks option is designed to meet the entry level requirements of the Washington State Parks Department. The interpretation option includes additional course work in natural and human history, communications, photography and behavioral sciences. Interpreters are those recreation specialists who design and create visitor center displays, signs, brochures, guided walks and campfire programs. The dispersed recreation management option is designed for those desiring training for a career in backcountry, wilderness and wild river management with state and federal land management agencies. The directed studies option provides the opportunity for a student and their adviser to develop a specialized program of courses designed to meet other specific career goals in wildland recreation.

Students and graduates find opportunities for summer and permanent employment with public land management agencies and private industry.

Description of Courses

For explanation see Index under "Symbols"

FRM

100 Introduction to Forest and Range Management 1 Management of forests and rangelands; land base, basic ecological relationships, institutions, job requirements, and career planning.

204 Silvics 1 (0-3) Prereq Bio S 103. Basic field skills in identification and data collection; habits of common western forest trees.

230 Principles of Renewable Resources Management 3 Same as WBI 230.

275 Recreation in America 2 Same as RLS 275.

300 Professional Development 1 (3-3) Professional development and personal skills of leadership in public and private land management agencies.

301 Forest and Range Environments 3 Prereq Bio S 103. Site factors and their effect upon forest and range vegetation.

302 Advanced Forest and Range Environments 3 (2-3) Prereq FRM 301; Bot 332. Classification systems used in characterizing Pacific Northwest forest and range communities including indicator and economically important species. Field trips required.

303 [U] Conservation of Renewable Resources 3 Philosophy and principles of conservation; identification of major uses of natural resources; case studies to illustrate conservation practices.

308 Silviculture 3 Prereq FRM 204, 301. Stand growth, forest dynamics, natural regeneration methods, and intermediate stand treatments.

309 Field Studies in Silviculture 1 (0-3) Prereq FRM 204, 301; c// in FRM 304. Field studies in forest regeneration and intermediate stand treatments.

311 Forest Economics 3 Prereq Econ 203 or Ag Ec 201; Math 171 or 202 or 140. Economic analysis applied to problems in the uses of forest lands and resources.

313 Forest Measurements 2 (1-3) Prereq Math 140, 171, or 202. Theory and application of forest measurements.

320 Timber Harvesting 3 (2-4) Prereq FRM 304 or c//. Not open to freshmen or sophomores. Current practices and problems; planning and coordinating timber harvesting with forest management. Joint listing with the University of Idaho (For ID374).

321 Introduction to Wood Technology 3 (2-3) Prereq Bio S 103. Anatomy of woody plants, identifying characteristics and properties of wood, and wood properties to processing and use. Field trips required. Cooperative course taught at the University of Idaho (For Pr ID351).

331 Forest Pathology 3 1 (3-6) Same as PL P 331.

348 Forest Entomology 3 (3-3) Principles and concepts of forest entomology; integration and application of basic knowledge; processes in dealing with forest insect problems.

351 Principles of Range Management 3 Basic concepts in range management; range history; physiology of range productivity and utilization; grazing management; range improvements.

352 Range Livestock Management 3 Prereq FRM 311. Not open to freshmen or sophomores. Range livestock management and nutrition in western grazing regions; proper use, grazing systems, water development; range improvement for livestock production. Field trips required.

354 Range Plant Communities 3 (1-6) Prereq Bot 332. Range grasses, forbs, browse, and poisonous plants; their identification, distribution, ecology, and management; economic and nutritive value.

371 Wildland Recreation 3 Not open to freshmen and sophomores. Historic development; benefits; federal, state, and local involvement; current problems and trends in the field of wildland recreation.

372 Wildland Recreation Field Laboratory 1 (0-3) Prereq c// in FRM 371. Field observation of recreation practices. Field trips required.

373 Interpretive Techniques 3 (3-3) Prereq FRM 371, 372. Fundamentals and practices in interpreting wildland biological and physical phenomena as related to public recreation. Field trip required. (a/y)

374 Forest Applications of Aerial Photo Interpretation 2 (1-3) Same as Sost 374.

380 Wildlife Habitat Management 3 Prereq FRM 301 or Bio S 372. Wildlife habitat management, life histories of forest and range wildlife species, interaction of timber and livestock production with wildlife.

399 Professional Internship 1 Prereq FRM 300; major in forest or range management. Integration of summer employment in professional directed programs with formal courses and summer reading assignments. (SS)

400 Professional Development II 1 Prereq FRM 300. Integration of summer professional experience.

402 Forestation 3 (2-3) Prereq FRM 304, 305. Nursery planting, seed and seedling problems, intermediate stand treatments. Field trips required. Credit not granted for both FRM 402 and 502.

403 Principles of Public Land Management Planning 3 Federal and Washington state land management planning processes, inventory techniques, public involvement, plan implementation, and leasing programs. Field trip required. Credit not granted for both FRM 403 and 503.

404 Forest Populations 1 Prereq enrollment in CEFES Program. Concepts of genetics, population dynamics and pest management applied to forest management.

411 Forest Finance and Valuation 3 Prereq Math 107. Economic and finance principles applied to forest management and appraisals.

412 Forest and Range Policy and Administration 3 Development and administration of U.S. forest and range laws and policies.

413 Forest Sampling 2 Prereq Cpt S 150, 151, or 153; FRM 204, 312; Stat 310 or QMeth 215. Forest sampling and cruising; sampling designs and estimating techniques needed in stand management.

415 Forest Management 3 Prereq FRM 304, 411. Application of analytical techniques to aid in choosing those management alternatives that contribute most to organizational objectives.

418 Forest Growth and Yield 2 (1-3) Prereq FRM 312, 314; Stat 310 or QMeth 215; Math 140, 171, or 202; Cpt S 150, 151, or 153. Factors
influencing forest yields, traditional prediction methods; development and application of growth and yield simulators. Credit not granted for both FRM 418 and 518.

430 Low Volume Forest Roads 3 Prereq FRM 330. Road classification and design of forest roads; construction techniques; cost, environmental considerations, design project. Three days of field trips. Cooperative course taught at the University of Idaho (ForPr 1D432).

433 Forest Tractor System Analysis 3 Prereq FRM 320. Planning, layout, and cost analysis of forest tractor systems, production estimating, machine capabilities, and options; layout project. Three days of field trips. Cooperative course taught at the University of Idaho (ForPr 1D433).

434 Cable Systems Analysis 3 Prereq FRM 320. Layout, planning, and design for cable logging systems; analysis of forces involved in cable logging; crew and terrain requirements; layout and design project; cost and equipment analysis. Three 1-day field trips. Cooperative course taught at the University of Idaho (ForPr 1D434).

451 Range Habitat Analysis 4 (2-6) Prereq Stat 310; Cpt S 150. Measurement and evaluation of range condition and trend for range livestock use and big game habitat; computer technology applied. Field trip required.

452 Range Development and Improvements 3 (2-3) Prereq FRM 351. Application of recent developments and research to the planning and administration of rangeland. Field trip required.

455 Applied Problems in Range Economics 1 (0-3) Prereq Ag Ec 340. Applications of economic analysis to range management problems.

456 Range and Ranch Planning 3 (2-3) Prereq FRM 452; Ag Ec 340. Integration of principles of range science and management planning with applications of computer technology. Field trip required.

460 Watershed Management 3 Principles and practices of management of forest and rangelands for protection, maintenance, and improvement of water resource values. Credit not granted for both FRM 460 and 560.

471 Wildland Recreation Management 3 (2-3) Prereq FRM 371, 372. Planning and management techniques applied to wildland recreation problems and situations. Field trips required. Credit not granted for both FRM 471 and 571. (a/y)

472 Dispersed Recreation Management 3 (2-3) Prereq FRM 471. Inventory systems, monitoring, and assessing resources and social impacts associated with dispersed recreational use of wildlands. Field trips required. Credit not granted for both FRM 472 and 572. (a/y)

474 Public Management in Wildland Recreation 3 Prereq FRM 371, 372. Techniques for managing public use in dispersed recreation settings. Field trips required. Credit not granted for both FRM 474 and 574. (a/y)

478 Wildland Recreation Planning 3 (2-3) Prereq FRM 301, 371, 471. Comprehensive area and development planning for wildland recreation and amenities in multiple-use and single-use settings. Field trips required. Credit not granted for both FRM 478 and 578. (a/y)

479 Internship V 1-12 An elective opportunity for select students to supplement their academic training with practical field experience.

480 Big Game Range Management 3 Prereq FRM 301, 330. Big game habitat management on rangelands and forested ranges; big game habitat rehabilitation. Credit not granted for both FRM 480 and 580.

499 Special Problems V I-4 May be repeated for credit.

501 Advanced Topics in Silviculture 2 May be repeated for credit. Prereq FRM 304, 402. Current silvicultural problems of special interest. (a/y)

502 Forestation 3 (2-3) Graduate level counterpart of FRM 402; additional requirements. Credit not granted for both FRM 402 and 502.

503 Principles of Public Land Management Planning 3 Graduate level counterpart of FRM 403; additional requirements. Credit not granted for both FRM 403 and 503.

504 Forest Management 2 Prereq FRM 304. Agroforestry systems used in the world including their current use in developing countries. Cooperative course taught at the University of Idaho (Range 1D595).

510 Advanced Forest Economics 2 Prereq FRM 411. Legislation and economic policies affecting forestry and the character and intensity of land use. Cooperative course taught at the University of Idaho (ForPr 1D581).

511 Forest Economics of Timber Demand and Supply 2 Prereq FRM 511. Economic analysis of factors affecting demand for and supply of public and private timber and related forest products. (a/y)

513 Forest Practices 3 Same as GenCB 513.


517 Advanced Forest Management 1 Prereq enrollment in CEFES program. Evaluation of forest growth and yield in forest ecosystem management.

518 Forest Growth and Yield 2 (1-3) Graduate level counterpart of FRM 418; additional requirements. Credit not granted for both FRM 418 and 518.

519 Advanced Topics V I-3 May be repeated for credit; cumulative maximum 6 hours.

524 Range Autecology 3 Prereq course in ecology or plant physiology. Adaptations of plant species in rangeland and forest communities; morphological and physiological mechanisms influencing establishment, productivity, competition, and grazing sensitivity. Field trips required. Cooperative course taught at the University of Idaho (Range 1D560).

526 Experimental Plant Ecology 3 (1-6) Experimental techniques in plant ecology with orientation toward environmental and physiological measurement in field and laboratory research.

530 Wildland Fire Management 3 Graduate level counterpart of FRM 430; additional requirements. Credit not granted for both FRM 430 and 530.

543 Forest Environments 4 Prereq enrollment in CEFES program. Meteorology, soils, and vegetation classification of forest environments.

551 Range Ecology—Concepts 3 Prereq two ecology courses. Ecological concepts of dynamics and distribution of plant communities; secondary succession processes, soil-vegetation relationships and implementation of vegetation classification schemes. Cooperative course taught at the University of Idaho (Range 1D551).

555 Seminar on International Range Management 3 May be repeated for credit; cumulative maximum 9 hours. Range management problems in developing countries and approaches to their solution.

559 Advanced Topics in Range Management V I-3 May be repeated for credit; cumulative maximum 6 hours. Prereq FRM 452. Review of current literature and its application in range management.

560 Watershed Management 3 Graduate level counterpart of FRM 460; additional requirements. Credit not granted for both FRM 460 and 560.

571 Wildland Recreation Management 3 (2-3) Graduate level counterpart of FRM 471; additional requirements. Credit not granted for both FRM 471 and 571. (a/y)

572 Dispersed Recreation Management 3 (2-3) Graduate level counterpart of FRM 472; additional requirements. Credit not granted for both FRM 472 and 572. (a/y)

574 Public Management in Wildland Recreation 3 Graduate level counterpart of FRM 474; additional requirements. Credit not granted for both FRM 474 and 574. (a/y)

578 Wildland Recreation Planning 3 (2-3) Graduate level counterpart of FRM 478; additional requirements. Credit not granted for both FRM 478 and 578. (a/y)

580 Big Game Range Management 3 Graduate level counterpart of FRM 480; additional requirements. Credit not granted for both FRM 480 and 580.

581 Large Herbivore Interrelationships 2 (1-3) Prereq 9 hrs upper-division animal science, range or wildlife management. Social and exploitative competition and other interactions among range livestock and big game; common-use grazing system modeling; quantitative methods. (a/y)

595 Seminar in Forest and Range Management 1 May be repeated for credit. Literature review; preparation and presentation of reports in forest and range science.

600 Special Projects or Independent Study Variable credit.

700 Master’s Research, Thesis, and/or Examination Variable credit.

702 Master’s Special Problems, Directed Study and/or Examination Variable credit.

General Departmental Requirements

Each of the programs in forest management, range management, and wildland recreation consists of a core curriculum and an option to be selected by the student.

FOREST MANAGEMENT
Core Requirements

The following curriculum meets professional standards established by the Society of American Foresters and the U.S. Office of Personnel Management.
At least 40 of the total hours required for the bachelor's degree in this program must be in upper-division courses. A minimum of 128 hours (exclusive of physical education activity courses) is required for graduation.

All forest management students are required to take the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Engl 101 Composition</td>
<td>3</td>
</tr>
<tr>
<td>Engl 402 Tech Writing</td>
<td>3</td>
</tr>
<tr>
<td>Bio S 103, and 104 or Bot 120</td>
<td>8</td>
</tr>
<tr>
<td>Math 107, 102; or 107, 108, 140; or 107, 108, 171</td>
<td>6-9</td>
</tr>
<tr>
<td>Chem 101, 102 or Chem 105, 106, 107</td>
<td>8-10</td>
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<td>Engl 101 Composition</td>
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<tr>
<td>Chem 101, 102 or Chem 105, 106, 107</td>
<td>8-10</td>
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</table>

Options in Forest Management

By the beginning of the junior year (60 semester hours), students in forest management are expected to have selected one of five options:

**Management:** C E 101; FRM 320, 331, 348, 402, 418; two additional courses from FRM 351, 371, 460, 480; electives approved by adviser.

**Science:** Bot 320, 462; Chem 240, FRM 331, 348; GenCB 301; electives approved by adviser.

**Wildlife Management:** FRM 351, 451, 480; Zool 224; Zoology 328, 435; 8 credits zoology and wildlife electives approved by adviser.

**Forest Business:** Econ 201, Accq 301, Mgt 360, B Law 210 or QMeth 215, Fin 325, or Econ 320, or Econ 340; electives approved by adviser. Econ 320 and 340 may not be taken pass/fail.

**Directed Studies:** 24-29 hours related course work approved by adviser and department chair, of which three-fourths of the hours are to be 300- and 400-level courses.

**RANGE MANAGEMENT**

Core Requirements

The following curriculum meets standards established by the Society of Range Management and the U.S. Office of Personnel Management. At least 40 of the total hours required for the bachelor's degree in this program must be in upper-division courses. A minimum of 128 hours (exclusive of physical education activity courses) is required for graduation.

All forest management students are required to take the following courses:

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<tbody>
<tr>
<td>Engl 101 Composition</td>
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<tr>
<td>Engl 402 Tech Writing</td>
<td>3</td>
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<tr>
<td>Bio S 103, and 104 or Bot 120</td>
<td>8</td>
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<tr>
<td>Math 107, 102; or 107, 108, 140; or 107, 108, 171</td>
<td>6-9</td>
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<tr>
<td>Chem 101, 102 or Chem 105, 106, 107</td>
<td>8-10</td>
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<tr>
<td>Engl 101 Composition</td>
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<tr>
<td>Engl 402 Tech Writing</td>
<td>3</td>
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<td>Bio S 103, and 104 or Bot 120</td>
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<td>Engl 402 Tech Writing</td>
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<tr>
<td>Math 107, 102; or 107, 108, 140; or 107, 108, 171</td>
<td>6-9</td>
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<tr>
<td>Chem 101, 102 or Chem 105, 106, 107</td>
<td>8-10</td>
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</table>

**Options in Wildland Recreation**

By the beginning of the junior year (60 semester hours), students in range management are expected to have selected one of five options:

**Management:** Bot 436, FRM 460, Geol 102; electives approved by adviser.

**Science:** Bot 436; FRM 331, 348; GenCB 301; electives approved by adviser.

**Wildlife Management:** FRM 480, Zool 224, 328, 435; 8 credits of zoology and wildlife electives approved by adviser.

**Forest Business:** Econ 201, Accq 301, Mgt 360, B Law 210 or QMeth 215, Fin 325, or Econ 320, or Econ 340; electives approved by adviser. Econ 320 and 340 may not be taken pass/fail.

**Directed Studies:** 18-23 hours related course work approved by adviser and department chair, of which three-fourths of the hours are to be 300- and 400-level courses.

**Range Livestock Production:** The range livestock production option involves changes in the preceding curriculum because of additional requirements in animal sciences. The curriculum is as follows:

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Chem 101, 102, or 105, 106, 107</td>
<td>8-10</td>
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<tr>
<td>Chem 240 Organic</td>
<td>3</td>
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<tr>
<td>Bio S 103 and 104 or Bot 120</td>
<td>8</td>
</tr>
<tr>
<td>Bot 320 Physiology</td>
<td>3</td>
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</tbody>
</table>

**WILDLAND RECREATION**

Core Requirements

The wildland recreation curriculum leads to the Bachelor of Science degree in Wildlife and Wildland Recreation Management. The curriculum offers options in forestry, state parks, interpretation, dispersed recreation management, and directed studies. The curriculum is designed for students desiring to work at the professional level for public agencies such as the National Park Service, U.S. Forest Service, Bureau of Land Management, Army Corps of Engineers, and Washington State Parks System. The curriculum is reviewed by professional recreation specialists and reflects skills and knowledge essential in entry-level positions with resource-based recreation agencies. With additional forestry courses, a student can also meet the U.S. Office of Personnel Management requirements for “forester.” The State Parks option includes 6 hours of criminal justice courses and additional courses in grounds and personnel management. The interpretation option includes additional course work in natural and human history, communications, photography, and behavior sciences.

At least 40 of the total hours required for the bachelor's degree must be in upper-division courses. A minimum of 128 hours (exclusive of physical education activity courses) is required for graduation. During the senior year all majors are required to complete a Senior Thesis, FRM 499. The objective of the Senior Thesis is to demonstrate the application of knowledge to a problem or situation in wildland recreation management.
All wildland recreation students are required to take the following courses:

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Chem Principles</td>
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<tr>
<td>Geol 102 Phys Geol</td>
<td>4</td>
</tr>
<tr>
<td>Bio S 103, 104 Intro Biol</td>
<td>8</td>
</tr>
<tr>
<td>Bot 332 Syst Bot</td>
<td>3</td>
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<tr>
<td>Bot 462 Synecology</td>
<td>3</td>
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<tr>
<td>Math 201</td>
<td>3</td>
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<tr>
<td>Stat 310</td>
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<tr>
<td>Cpl S 153</td>
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<tr>
<td>Engl 101 Composition</td>
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<td>Engl 402 Tech Writing</td>
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<tr>
<td>Soils 201</td>
<td>3</td>
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<tr>
<td>SpCom 102 or AgSIE 203</td>
<td>3</td>
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<tr>
<td>Zool 330 Prin Conserv</td>
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<tr>
<td>FRM 204 Silvics</td>
<td>1</td>
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<td>FRM 230 Prm Renew Res Mgmt</td>
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<tr>
<td>FRM 301 For &amp; Rg Envir</td>
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<tr>
<td>FRM 371 Wild Rec</td>
<td>3</td>
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<tr>
<td>FRM 372 Wild Rec Field Lab</td>
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<tr>
<td>FRM 373 Interp Tech</td>
<td>3</td>
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<tr>
<td>FRM 403 Prm Pub Lnd Mgmt Plan</td>
<td>3</td>
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<tr>
<td>FRM 471 Wild Rec Management</td>
<td>3</td>
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<tr>
<td>FRM 472 Dispersed Rec Mgmt</td>
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<tr>
<td>FRM 474 Public Mgmt</td>
<td>3</td>
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<tr>
<td>FRM 478 Wild Rec Plan</td>
<td>3</td>
</tr>
<tr>
<td>FRM 499 Senior Thesis</td>
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<tr>
<td>Soc S Electives</td>
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<tr>
<td>Hum Electives</td>
<td>9</td>
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<tr>
<td>Intercultural Studies</td>
<td>3</td>
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</tbody>
</table>

Options in Wildland Recreation

By the beginning of the junior year (60 semester hours) students are expected to have selected an option in the wildland recreation field. The option will add an additional 12-18 semester hours to the core curriculum. Options are available in the following areas:

- **Forestry**: FRM 313, 411 and electives approved by adviser.
- **State Parks**: Cm J 101, 210, L A 264 and electives approved by adviser.
- **Interpretation**: Anth 435, Bot 463, FRM 351, Zool 423, 428 and electives approved by adviser.
- **Dispersed Recreation Management**: Bot 463, Soils 415, Zool 310, 335 and electives approved by adviser.
- **Directed Studies**: 12-18 hours of related course work approved by adviser and department chair of which three-fourths of the hours are to be 300- and 400-level courses.

Transfer Students

Transfer students should plan to complete the basic courses in English, speech, chemistry, biology, mathematics, social sciences, and humanities by the end of their sophomore year. Ten hours of unspecified forestry credit is given for a technician's degree. Refer to WSU bulletin on Transfer Programs for Community Colleges, available through community college advisers, for details on transferable courses.

Graduate Programs

Students wishing to develop their skills beyond the four-year programs and having strong performance records in undergraduate work may elect to enroll in graduate programs. These programs lead to the degree of Master of Science in Forest and Range Management. Both thesis and non-thesis master's programs are offered.

MINORS IN FORESTRY, RANGE MANAGEMENT, AND WILDLAND RECREATION

Students wishing to obtain a minor in forestry, range management, or wildland recreation must complete one of the programs shown below.

- **Forestry**: 16 hours from FRM 301 or 303 or Bio S 372; FRM 204, 304, 305, 313, 411, 415.
- **Range Management**: 18 hours from FRM 301 or 303 or Bio S 372; FRM 351, 354, 452; Soils 201; FRM 430 or 352 or 480.
- **Wildland Recreation**: 18 hours from FRM 371, 373, 403, 471; FRM 474 or 478.

Program in General Biology

**Professor and Program Head**: W. R. Rayburn; Professors, J. L. Hindman, R. J. Jonas, J. N. Mack, L. P. Mallavia, K. D. Spence; Associate Professors, E. S. Broch, J. W. Crane, K. V. Kar- dong, H. A. Went, G. J. Williams, G. L. Young; Instructor, J. C. Horne.

The introductory biological science courses provide background in the concepts common to life sciences and an overview of the diversity of animals, plants, and microorganisms. They meet General University Requirements and may be prerequisite for courses in microbiology, botany, and zoology. Advanced biological science courses probe specific areas in depth.

This program leads to the degree of Bachelor of Science in Biology and Master of Science in Biology.

Five options are available for the Bachelor of Science degree: botany, general biology, genetics and cell biology, biology education, and pre-medical training. A minor in biology is offered.

Description of Courses

For explanation see Index under “Symbols”

**Bio S 101 [B] Direction in Biological Sciences 3**

Understanding biology as a science and its effect on issues within society. Credit not granted for more than one of Bio S 101, 102, 103.

**Bio S 102 [B] General Biology 4 (3-3)**

Not open to students who have taken a college-level course in general biology or botany. Nature of living things, methods, and function of diverse organisms. Credit not granted for Bio S 102 and 101, 103 or 105.

**Bio S 103 [B] Introductory Biology 4 (3-3)**

Prereq I sem Chem or c/. First semester of a one-year sequence. Recommended for pre-professional students. The nature of life, structure, function, genetics, growth, and development. Credit not granted for 103 and 101, 102, or 105.

**Bio S 104 [B] Introductory Biology 4 (3-3)**

Prereq Bio S 103 (Bio S 101 or 102 with a grade of A or B may be substituted); 2 sem Chem or c/. Continuation of Bio S 103. Biology of organisms; plants, animals, bacteria, ecology, and evolution.

**Bio S 105 [B] Biological Science Laboratory 1 (0-3)**

Prereq Bio S 101. Elements of structure and function of organisms. For non-majors in the biological sciences. Credit not granted for more than one of Bio S 105, 102, 103.

**Bio S 201 [B] Contemporary Biology 1 Prereq Bio S 101, 102, 103, Micro 101, or Bot 120. Biological information that provides a framework for understanding life processes; impact of biological information on human affairs.**

**Bio S 208 [B] Biological Science Honors 4 (3-3)**

Prereq Chem 295.


Environmental biology, unifying principles of ecology, populations, ecosystems, and the role of humans in a changing environment.

**Bio S 321 [B] Methods of Teaching Science 3 (2-1)**

Prereq 12 hrs science; E1/Se 303. Methods, philosophy, and structure of science; application in teaching middle and secondary school science courses.

**Bio S 322 [B] Human Ecology 3 Prereq Bio S 104. Biological basis of interdisciplinary human ecology; applicability of ecological principles to Homo sapiens; emergence of man as the ecological dominant.**

**Bio S 323 [B] Physical Therapy Clinical Experience V 1-4**

May be repeated for credit; cumulative maximum 20 hours. By interview only. Work experience under supervision of a qualified professional in treatment of human physical disabilities.

**Bio S 324 [B] Internship in Biology V 2-4**

May be repeated for credit; cumulative maximum 8 hours. Prereq major in Bio S. By interview only. Experience in work related to specific career interests.

**Bio S 325 [B] Special Problems V 1-4**

May be repeated for credit.

**Bio S 326 [B] Special Projects or Independent Study Variable credit.**

**Bio S 327 [B] Master's Research, Thesis, and/or Examination Variable credit.**

**Bio S 328 [B] Master's Special Problems, Directed Study and/or Examination Variable credit.**

Schedule of Studies

At least 40 of the total hours required for the bachelor's degree must be in upper-division courses.

All majors are required to take the following courses: Bio S 103 and 104; Chem 105, 106, 107, and 240; Math 107 and 108; Phys 101 and 102.

In addition to the above requirements, students select one of the following options:

- **General Biology Option**: Math 140 or 171, GenCB 301, BC/BP 364, Bio S 372, Bot/Zool 405, Bot/GenCB/Zool 450 and additional hours in biological science courses to total 40 hours.

- **Biologi Education Option**: GenCB 301, BC/BP 364, Bio S 372, Bio S 430, Bot/GenCB/Zool 450, and additional hours in biological science courses to total 35 hours. Geol 102 for Junior High candidates; E1/Se 300, 303, 403 or 404, 405 or 406, and 450 or 451, EdPsy 301, 402, CoPsy 338 or 359, Psych 105, H Ed 480 or 481.

- **Botany Option**: Math 140 or 171, GenCB 301, BC/BP 364, Bio S 372, Stat 412; Bot 320, 332, 405, 411 or 426, 448 or 460 or 462, 450, and a minimum of 2 hours of 499.

- **Genetics and Cell Biology Option**: Math 140 or 171, BC/BP 364, GenCB 301, 402, 450 and 499; two courses from Micro 201, 428, Bot 320, 411 and Zool 320, 352, 353; two courses from A S 330, Bot/Zool 405, Agron 445, and GenCB 430, 450, 502, 511, 540 and additional hours in biological and physical science courses to total 67 hours.

1Open only to students in the Honors Program.
General Studies

Pre-Physical Therapy Option: Soc 101, Psych 105, 333, 351, Micro 201, Zool 251, 315, GenCB 301, PEP 362, 465, Bio S 491, and additional hours in biological science courses to total 40 hours.

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 Program Chair.

Preparation for Graduate Study
Students with undergraduate majors in such fields as microbiology, biology, botany, zoology, and plant or animal sciences in the College of Agriculture and Home Economics may be prepared for graduate study in biology. Graduate Record Examination scores from the General Aptitude and Advanced Biology section are required.

General Studies
General Studies is for students who have varied interests that may cut across the usual departmental boundaries, and who wish to play a major role in deciding on a suitable curriculum of study. The student earns a Bachelor of Arts in Humanities, Bachelor of Arts in Social Sciences, Bachelor of Science, or Bachelor of Liberal Arts degree depending upon the program selected. The degree is not identified with a special subject matter field on the diploma.

Total credits for graduation of 120 semester hours should include 40 credits or more in courses at the 300- and 400-level.

Students who wish to enroll in General Studies should consult the appropriate coordinator listed below under the various divisions.

Biological, Mathematical, and Physical Sciences
B. Lentz, Coordinator

This division of General Studies is for students who are interested in interdisciplinary programs which offer broader options in course selections than are possible within single departments. The only restrictions are that each major program be coherent and that upper-division courses be represented to the greatest degree consistent with appropriate prerequisites.

Each student will (1) satisfy the General University Requirements and any additional requirements of the College of Sciences and Arts, (2) earn 120 semester hours, that normally include 40 or more at the upper-division level, (3) devise a program of study under a defined goal of some future career or of post-graduate study in consultation with the coordinator, (4) achieve at least a 2.00 g.p.a. in program course work.

Plan A. A major concentration of courses not less than 24 credits in a single science department, program or area including at least 15 upper-division hours, and a minor concentration not less than 15 credits in another department, program or area including at least 6 upper-division hours.

Plan B. A combination of biological sciences courses not less than 39 credits in three or more departments or programs including at least 21 upper-division hours.

Plan C. A combination of mathematical and physical sciences courses not less than 39 credits in three or more departments or programs including at least 21 upper-division hours.

Classical Studies
R. S. Williams, Coordinator

The classical studies option is designed for students who wish to obtain a broad understanding of the ancient Greek and Roman foundation of modern Western Civilization. Greek and Latin language study is an important part of the program in order to aid comprehension of classical thought, literature, and history. This major should be of great value for students contemplating careers in medicine, law, and business or graduate work in history, archaeology, or literature. It is not suitable for those who wish to major in Greek or Latin at graduate school in classics unless additional language study is undertaken. The approach is interdisciplinary and flexible to allow students to pursue varied interests within a broad field. This major leads to the degree of Bachelor of Arts in Humanities.

Degree Requirements

MAJOR. General Studies - Classical Studies
Each student must complete (1) the General University Requirements and any additional requirements of the College of Sciences and Arts, (2) 120 semester hours which normally includes 40 or more at the upper-division level, (3) a second year (or its equivalent) of Greek or Latin language, (4) 36 hours including: Hours
P A 201 Art of Western Civil 3
Hist 360 Ancient Greece 3
Hist 341 Rome: Rep & Emp 3
Hum 100 Mythology 2
Hum 101 Hum Anc World 3
Hum 301 Greek & Rom Drama 2
Phil 300 Anc & Med Phil 3
(5) 17 hours from Hours
Anth 336 Classical Archaeology 3
Engl 308 Intr Lit Crit 3
P A 202 Art Western Civ 3
P A 301 Classical Heritage 3
Hist 381 Sci West Civ 3
Pol S 437/Hist 488 Class Pol Thot 3
Hist 440 Early Middle Ages 3

Additional Greek and Latin beyond the basic language requirements, appropriate seminars, special offerings, and independent study from associated departments must be selected with the approval of the Coordinator of the Classical Studies option.

MINOR. Students wishing to minor in Classical Studies are required to take a minimum of 16 hours of course work chosen from the above list, at least 8 of which are at the 300-level and above. Students are encouraged, but not required to take a classical language.

Humanities and Social Sciences
B. Lentz, Coordinator

This division of General Studies is for students whose primary interest in the humanities or social sciences requires interdisciplinary programs and course selections which are not possible within single academic programs or established curricula. It is expected that the student’s major program will be coherent, that it will include as many upper-division hours as possible consistent with appropriate prerequisites, and that it will be aimed at a general education or oriented toward a future career.

Each student must (1) satisfy the General University Requirements and any additional requirements of the College of Sciences and Arts, (2) earn 120 semester hours which normally include 40 or more at the upper-division level, (3) establish an acceptable program in consultation with the coordinator from one of the plans set forth below, (4) achieve at least a 2.00 g.p.a. in program course work.

Plan A. A concentration of courses at least 24 credits in a single academic department (humanities or social sciences) or special curriculum including at least 15 upper-division hours and a minor concentration of at least 15 credits in another department or special curriculum including at least 6 upper-division hours.

Plan B. A combination of humanities courses of at least 39 credits involving three or more academic departments, with a minimum of 9 hours in each of the three areas including at least 21 upper-division hours.

Plan C. A combination of social science courses of at least 39 credits involving three or more academic departments, with a minimum of 9 hours in each of the three areas including at least 21 upper-division hours.

Liberal Arts
R. Littlewood, Coordinator

Students who choose this option design their own major with the help of the adviser. The major is conceived of as the pursuit of a coherent body of knowledge beyond the usual departmental boundaries. In this process, the student is expected to become literate and skillful in the use of the English language, attain competence in a foreign language, and demonstrate a capacity for rational evaluation and discourse.

Normally in this program students will also: (1) satisfy General University and College of Sciences and Arts Requirements; (2) produce during their senior year, a thesis or project on a topic arising out of their particular course of studies; (3) carry on a significant portion of their studies guided by independent reading; and (4) earn at least half of the credit hours, after joining the program, in upper-division and perhaps some graduate courses.

Linguistics
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 the formal theories of linguistic analysis and the historical study of language.

The major in linguistics requires 40 credit hours, variously distributed among the following courses, depending upon the particular emphasis which the student and adviser together select. Each of the following general areas must be represented in the program:

Linguistics: Anth 250, 350, 450, 456, 499; Engl 256, 354, 458, 499; 21 or more hours including at least one historical course.

Mathematics, Computer Science, and Statistics: Math 107, 171, 172, 201, 202, Stat 360; Cpt S 150, 260, 405; 3 to 12 hours depending upon special emphasis.
Program in Genetics and Cell Biology


The Program in Genetics and Cell Biology offers graduate study and research programs leading to the degrees of Master of Science and Doctor of Philosophy in Genetics and Cell Biology. Areas of specialization include, but are not limited to, genetic engineering, molecular genetics, cell biology, biochemical and developmental genetics, mutagenesis, cytogenetics, population and quantitative genetics, and wheat and barley breeding. The program consists of core faculty members who hold joint appointments in Genetics and Cell Biology and cooperating departments, and associate members who have courtesy appointments in the program which allows them to act as advisers for graduate students majoring in Genetics and Cell Biology. Cooperating departments include Agriculture, Animal Sciences, Biochemistry and Biophysics, Botany, Microbiology, Plant Pathology, Pure and Applied Mathematics, Veterinary and Comparative Anatomy, Pharmacology, and Physiology, Veterinary Microbiology and Pathology, and Zoology, and the Institute of Biological Chemistry.

Faculty are actively involved in the following research: DNA replication of plasmids and bacteriophages, mutagenesis, plant molecular genetics, genetic engineering of plants, breeding and genetics of wheat and barley, breeding and genetics of dry edible legumes, biochemistry and genetics of DNA repair, biochemistry of chromatin structure and function, cellular regulatory mechanisms, positional control in cellular development, gene expression in animals, gene function associated with plant-fungal interactions, molecular genetics of viruses, chemical carcinogenesis and neo-plastic progression, mechanisms of flagellar and ciliary motion, chromosome evolution in fish, mathematical modeling of genome and mobile genetic element evolution, population genetic models of kin selection and genetic variation, and evolution in geographically structured populations.

One rapidly growing area at Washington State University is genetic engineering of eukaryotes. Several faculty are working together on the basic biology of gene transfer with the intention of introducing improved domesticated plants and animals.

The interdisciplinary role of genetics and cell biology is emphasized, thus permitting students to study with scientists who represent a wide range of research interests in plant, animal, and microbial genetics. Many of the faculty research interests have a major cellular orientation and consequently training in cell biology as well as more strictly genetic areas is available within the program.

The Program in Genetics and Cell Biology, being an interdepartmental organization, enjoys the availability of many and highly diverse facilities for research. Faculty laboratories are well equipped with modern equipment, especially in the recombinant DNA area, molecular genetics, and cell biology. Biochemistry, cytology, mathematics, statistics, and physiology are the principal avenues through which knowledge of genetics and cell biology is acquired. These subjects are necessary supplemental areas of study for students in the program.

Students who receive master's and PhD degrees obtain positions in basic and applied genetics at universities, federal and state colleges, private industry, including biotechnology and plant and animal breeding, and in some cases in specialized medical research.

Description of Courses

For explanation see Index under "Symbols"

GenCB

201 (B) Genetics and Society 3 Preq CB B 102. Genetics as it relates to current social issues; genetic engineering, genetic disease, and cancer.

301 General Genetics 4 Preq CB B 104; 2 sem. Chem. Principles of modern and classical genetics.

402 General Genetics Laboratory 2 (0-6) Preq GenCB 301 or C/. Basic principles of modern and classical genetics utilizing several species.

430 Human Genetics 3 Preq GenCB 301 or 201. Exploration of individual and population genetics leading to critical discussion of current social, medical, and scientific issues.

450 Cell Biology 3 Preq BC/BP 364; GenCB 301. Cellular structure and function.

462 Microbial Genetics 3 Same as Micro 462.

485 Molecular Genetics V-2-4 Preq elementary course in genetics. Molecular basis of genetics: DNA, RNA, protein biosynthesis, and genetic engineering. (a/y) Cooperative course taught at the University of Idaho (Bact ID485/SBS).

499 Special Problems 1-4 May be repeated for credit.

502 Eukaryotic Molecular Genetics 2 Preq GenCB 301. Gene control and organization; lower eukaryotic and cell culture genetics.


513 Forest Genetics 3 (2-3) Preq GenCB 301; course in silviculture. Application of principles of genetics to the improvement of trees and silvicultural practices. (a/y) Cooperative course taught at the University of Idaho (For ID527).

514 Forest Tree Improvement 3 Preq GenCB 301; course in silviculture. Practical problems and techniques related to genetic improvement of forest trees. Field trips required. (a/y) Cooperative course taught at the University of Idaho (For GenCB 525).

516 Fish Genetics 2 Preq GenCB 301. Chromosomal, biochemical, quantitative, and ecological aspects of fish genetics with emphasis on applications to aquaculture and fish management. (a/y)

535 Physiology and Genetics of Parasitism 3 Same as PL P 535. (a/y)

540 Cytogenetics 3 Preq GenCB 301. Chromosome structure, behavior, and evolution; effects of change in chromosome number and structure. (a/y)

550 Advanced Cell Biology 3 Preq GenCB 450. Cell structure and movement, organelle structure and genome, and cell signal processing.

560 Molecular Genetics 3 Preq GenCB 301, Micro 201, or GenCB 502; BC/BP 364.
Biocellular description of genetic processes in microorganisms.
562 Mathematical Genetics 3 Same as Stat 562. (a/y)
569 Nucleic Acid Biochemistry 3 Same as BC/BP 569. (a/y)
570 Plant Molecular Genetics 3 Prereq GenCB 502. Plant molecular genetics with emphasis on systems specific to plants and plant genetic engineering. (a/y)
575 Molecular Biology Techniques I 1-0-3 Same as BC/BP 575.
576 Molecular Biology Techniques II 1-0-3 Same as BC/BP 576.
577 Molecular Biology Techniques III 1-0-3 Same as BC/BP 577.
581 Advanced Topics in Genetics V 1-2 May be repeated for credit. Prereq GenCB 511 or 502. Recent research in selected areas of genetics.
592 Advanced Topics in Cell Biology V 1-3 May be repeated for credit; cumulative maximum 7 hours. Current research in cell structure and function.
598 Seminar I May be repeated for credit. Prereq GenCB 301. Reviews of recent and classical research in genetics, cytology, and cell biology.
600 Special Projects or Independent Study Variable credit.
700 Master's Research, Thesis, and/or Examination Variable credit.
702 Master's Special Problems, Directed Study, and/or Examination Variable credit.
800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Geological Engineering

Professor and Program Chair, F. F. Foi, Jr.; Professors, S. K. Bhagat, J. F. Orsborn, G. D. Webster; Associate Professors, R. J. Frager, D. L. Johnston, R. L. Thiessen, A. J. Walkinsen; Assistant Professor, F. E. Poeter.

Geological engineering is an interdisciplinary curriculum of the Department of Geology and the Department of Civil and Environmental Engineering. The bachelor's degree program is accredited by the Engineering Accreditation Commission (EAC) of the Accreditation Board for Engineering and Technology (ABET).

The undergraduate program is designed to develop in the student a solid foundation in the principles of geology and engineering so that the graduate can integrate in-depth knowledge of geologic conditions into the design of engineering structures. Although the undergraduate curriculum is fairly rigid to meet the accreditation standards, some flexibility is available through choice of electives, and students may direct their interests into either geotechnics or hydrogeology.

Because of the ever-increasing knowledge required to practice at high levels of competence in the diverse areas of geological engineering, it is recommended that the student pursue studies through the MS degree.

The courses of study lead to the degrees of Bachelor of Science in Geological Engineering and Master of Science in Geologic Engineering. Advanced graduate students wishing to specialize in geological engineering may work towards a PhD in geology, civil engineering, or engineering science.

Description of Courses

Description of all courses in the following schedule of studies are given under the individual listings according to the department prefix.

Schedule of Studies

A Bachelor of Science degree in Geological Engineering ordinarily requires a total of 135 hours. At least 50 of the total hours required for this degree must be in upper-division courses.

Freshman Year

First Semester
- Math 171 Calculus I
- Chem 105 Principles
- M E 101 Graphical Design
- Engl 101 Composition
- Hum Elective

Second Semester
- Math 172 Calculus II
- Chem 106 Principles
- M E 102 Descriptive Geometry
- C E 101 Intro Surveying
- Geol 102 Phys Geol

Sophomore Year

First Semester
- Math 220 Intro Linear Algebra
- Phys 201 Classical
- Geo 350 Mineralogy
- C E 211 Statics
- Hum Elective

Second Semester
- Math 315 Diff Eq
- Phys 202 Classical
- Cpt S 203 Eng Math
- C E 314 Mechanics of Materials

Junior Year

First Semester
- C E 317 Geotech I
- Geo 340 Structures
- Geo 421 Stratigraphy
- Geo/C E 409 or Stat 360
- Engl 201, 402, ScPom 102

Second Semester
- C E 315 Fluid Mechanics
- Geo/C E 440 Rock Mechanics
- Geo/C E 430 Geomorphology
- Geo/C E 306 Intro Petrology
- Soc S Elective
- Econ 102 or 201

Summer Session
- Geo 308 Field Geol

Senior Year

First Semester
- C E 417 Geotech II
- Geo/C E 426 Engr Geol
- Geo/C E 475 Groundwater
- Geo/C E 405
- Dept Elective

Second Semester
- C E 351
- Geo/C E 403 Evir Geol
- C E 603 Engr Adm/Econ
- Intercultural Elective
- Dept Elective

Certification

Freshman students entering the university are placed in the Curriculum Advisory Program (CAP). Each student interested in geological engineering is assigned a geological engineering advisor. The students remain in CAP until they have completed one year of calculus and either two semesters of chemistry or one semester of chemistry and one semester of physics. After completing these courses, the student is eligible to apply for admission to Pre-Engineering. During CAP and Pre-Engineering tenure, the student will take the prerequisites courses necessary for certification into the Geological Engineering program.

Transfer students will be accepted for the program only if they have demonstrated adequate proficiency in the courses which they transfer as part of the program curriculum. If less than 50 credit hours of program requirements have been completed, a transfer student may be accepted in the Curriculum Advisory Program, with final consideration of certification coming after completion of the first three semesters of the program curriculum.

Transfer Students

Students who are planning to transfer to geological engineering at Washington State University from other institutions should coordinate their studies with the program chair to establish an integrated program leading to the bachelor's degree. This is desirable because of the sophomor professional requirements, course sequences, and the need for engineering physics and good preparation in mathematics.

Department of Geology

Professor and Department Head, F. F. Foi, Jr.; Professors, P. R. Hooper, P. E. Rosenberg, G. D. Webster; Professor Emeritus, R. K. Sorem; Adjunct Professors, V. Heferman-Rosenberg, P. J. Mebinger; Associate Professors, L. D. Mehnert, R. L. Thiessen, A. J. Walkinsen; Assistant Professors, S. L. Dobek, D. R. Gaykord, P. B. Larson, E. M. Poeter; Adjunct Assistant Professors, A. J. Busseca, J. R. Elison.

Geology is the study of the Earth, its composition, structure, origin, and evolution. Virtually every aspect of modern life is in some way dependent on the science of geology. For example, the geologist's job to discover new reserves of energy and raw materials, evaluate geologic hazards in land use planning and unravel the mechanisms of continental drift and biological evolution.

Both general and advanced training is offered in most specializations in geology. The lower-division courses are designed to provide a strong foundation for those who major in geology as well as a stimulating introduction to earth science for the non-major. The upper-division courses provide training for professional geological work as well as preparation for graduate study.

The department has modern teaching facilities and special equipment, including an electron microscope, X-ray diffraction and fluorescence machines, transmitted and reflected light microscopes, for graduate study and research. There are active research programs in igneous petrology, geochronology and mineralogy, structural geology and tectonics, economic geology, groundwater hydrology, sedimentology and stratigraphy and paleontology.

The department offers courses of study leading to the degrees of Bachelor of Science in Geology,
Description of Courses

For explanation see Index under "Symbols"

Geol

101 [P] Introduction to Geology (4-3-S) Not open to students with credit in Geol 102. Introductory physical geography for non-science majors; emphasis on western U.S.

102 [P] Physical Geology (4-3-S) Not open to students with credit in Geol 101. For science majors and honors students. Modern concepts of earth science; mineral rock, resource, and map study. Field trip required.

306 Introductory Petrology 3 (2-3) Prereq Geol 101 or 102. Two sample analysis, petrogenesis and field relationships of rocks. Field trip required.

308 Field Geology 5 (0-18) Prereq Geol 306, 340. Detailed geologic mapping of an area; practice in methods of geologic field work. (SS)

310 [P] Evolution and Earth History 4 (3-3) Prereq Geol 101 or 102. History and development of the Earth's physical features and its inhabitants. Field trip required.

317 Geotechnical Engineering 3 (2-3) Same as C E 317.

320 Spring Field Trip Preparation 1 May be repeated for credit. Prereq Geol 310. Reading in preparation for geology spring field trip.

321 Spring Field Trip 1 (0-3) May be repeated for credit. Prereq Geol 310. A week field trip to study lateral changes of sedimentary rocks of a selected area of the western United States.

340 Geologic Structures 4 (3-3) Prereq Geol 101 or 102. Field trip required.

350 Mineralogy and Crystallography 4 (2-6) Prereq Geol 101 or 102; Chem 101 or 105. Composition, physical properties, structure, crystallography, identification, and origin of minerals. Field trip required.

355 Optical Mineralogy 3 (2-3) Prereq Geol 350, Phys 102 or 202. Elements of optical crystallography and optical identification of minerals.

400 Professional Experience Internship V 2-4 May be repeated for credit; cumulative maximum 4 hours. By interview only. Supervised experience in approved company or government agency.

403 Environmental Geology 3 Prereq Geol 102 and 340 or C E 317. Geological hazards and geologic problems associated with human activities. Field trip required.

405 Geophysical Engineering 4 (3-3) Same as C E 405. Credit not granted for both Geol 405 and 505.

409 Numerical Geology 3 Prereq Cpt 5 203; Geol 340 or c/c. Stat 360. Analysis of geologic and geological engineering problems using numerical, statistical, and computer methods; analyzing spatial data.

410 Invertebrate Paleontology 4 (3-3) Prereq Geol 310. Morphology, classification, evolution, and ecology of fossil invertebrate organisms. Field trip required.


421 Principles of Stratigraphy 3 (2-3) Prereq Geol 310. Correlation and dating of sedimentary strata; tectonics and sedimentary basins; regional patterns of sedimentation.

426 Engineering Geology and Geomorphology 3 Same as C E 426. Credit not granted for both Geol 426 and 526.

428 Introduction to Geostatistics 3 Applications of random variables and probability in geologic and engineering studies; regression, regionalized variables, spatial correlation, variograms, kriging and simulation. Cooperative course taught at the University of Idaho (Geol ID428).

430 Quantitative Geomorphology 3 Prereq Geol 310. Modern quantitative techniques for analyzing the processes of landscape formation.

440 Rock Mechanics 3 (2-3) Prereq Geol 340; C E 317, 318. Mechanical behavior and properties of rocks using data from laboratory experiments and field observations.

441 Geomechanics 3 Prereq Geol 355. Minerology and petrology of igneous rocks, using the polarizing microscope. Field trip required.

462 Metamorphic Petrology 2 (1-3) Prereq Geol 461 or c/c. Minerology and petrology of metamorphic rocks, using the polarizing microscope. Field trip required.

470 Introduction to Economic Geology 4 (3-3) Prereq Geol 340, 350. Genesis, evolution and tectonic setting of ore deposits combining theoretical and descriptive, and detailed hand specimen analysis. Field trip to major mining districts.

475 Ground Water Hydrology 3 Prereq Geol 340 or C E 351. Fundamentals of groundwater accumulation, storage, and flow; exploration and development.

480 Introductory Geochemistry 3 Prereq Chem 106; Geol 102 or 310. The chemistry of earth materials and processes.

491 Remote Sensing and Geologic Applications 3 (2-3) Prereq Geol 101 or 102; Phys 102 or 202; Geol 340. Remote sensing techniques and their utilization in geologic studies, air photos, radar, IR, and Landsat imagery used. Field trip required. Credit not granted for both Geol 491 and 591. (a/y)

492 Geology of the Grand Canyon 1 Field study of the geologic features of the Grand Canyon, Arizona including 7½ day float trip. (SS)

498 Undergraduate Seminar 1 May be repeated for credit; cumulative maximum 3 hours. Prereq major in Geol or related field. Research papers presented by students, faculty, and visiting scientists on geological research.

499 Special Problems V 1-4 May be repeated for credit.

500 Instructional Practicum 1 May be repeated for credit; cumulative maximum 4 hours. By interview only. Theory and practice of laboratory teaching in geology.

505 Geophysical Engineering 4 (3-3) Same as C E 505. Graduate level counterpart of Geol 405; additional requirements. Credit not granted for both Geol 405 and 505.

506 Exploration Seismics 3 Prereq Phys 201; Geol 340, 421. Advanced geophysics, fundamentals of seismic exploration, and signal processing. Field trip required.

508 Advanced Field Methods 3 (0-9) May be repeated for credit. Individual instruction in advanced methods of field geology. (SS)

511 Advanced Topics in Paleontology 3 Prereq Geol 410, 420. Advanced problems and new techniques in paleontology from current literature. (a/y)

512 Palynology 4 (3-3) Same as Anth 576.

513 Geomorphology 3 Past environments; interrelation of physical and biological factors; changes in the physical environments. (a/y) Cooperative course taught at the University of Idaho (Geol ID515).

516 Methods in Paleontology and Biostratigraphy 3 (1-6) Prereq Geol 410. Methods of collection, preparation, illustration, and interpretation of paleontological data; principles of systematic paleontology; statistical graphic data presentation. Field trip required. (a/y) Cooperative course taught at the University of Idaho (Geol ID516).

518 Biostratigraphy 3 Techniques of correlation of sedimentary rock units and construction of relative time scale, evolution, extinction, biogeography, and animal assemblages. Cooperative course taught at the University of Idaho (Geol ID518).

520 Advanced Topics in Sedimentary Rocks 3 (2-3) May be repeated for credit; cumulative maximum 6 hours. Prereq Geol 420, 421. Modern aspects of sedimentary rocks. (a/y)


522 Coal Geology/Petrology 3 (2-3) Geology and petrology of coal. (a/y)

523 Advanced Topics in Stratigraphy 3 May be repeated for credit. Prereq Geol 421. (a/y)

525 Carbonate Depositional Systems 3 (2-3) Prereq Geol 420. Modern carbonate environments and processes; ancient carbonate rock sequences; carbonate platform-to-basin transition; diageneis of carbonate rocks. Field trip required.

526 Engineering Geology and Geotechnics 3 Same as C E 526. Graduate level counterpart of Geol 426; additional requirements. Credit not granted for both Geol 426 and 526.

527 Petrology of Clastic Rocks 3 (2-3) Prereq Geol 420. Hand sample and thin section petrography and petrology of terrigenous sedimentary rocks. Field trip required. Cooperative course taught at the University of Idaho (Geol ID527).

528 Petrology of Carbonate Rocks 3 (2-3) Prereq Geol 420. Hand sample and thin section petrography and petrology of limestones and dolomites. Field trip required. Cooperative course taught at the University of Idaho (Geol ID526).

529 Geologic Development of North America 3 Prereq Geol 410, 421. Sedimentation, tectonics, stratigraphy of North America; Cordilleran geology. Field trip required. Cooperative course taught at the University of Idaho (Geol ID492).


531 Structural Analysis 3 (2-3) Prereq Geol 340. Structural analysis of complexly deformed rocks in both physical and biological settings.

550 Advanced Mineralogy 3 Prereq Geol 355; Chem 106. Elements of crystal chemistry and crystal physics.

552 X-Ray Analysis in Geology 3 (2-3) Generation and use of X-rays for geological research; electron microprobe/SEM, X-ray fluorescence and X-ray powder diffraction. (a/y)

560 Advanced Igneous Petrology 3 (2-3) Prereq Geol 361. Petrogenesis of igneous rocks. (a/y)

561 Advanced Mineral Deposits 3 Ore mineralogy and sulphide phase equilibria; microscopic studies of natural and synthetic sulphide minerals. (a/y) Cooperative course taught at the University of Idaho (Geol 3575).

562 Advanced Metamorphic Petrology 3 (2-3) Prereq Geol 461, 462. Characterization and genesis of metamorphic rocks. Field trip required. (a/y)

563 Igneous Petrogenesis 3-2 Prereq Geol 560, 581. Chemical and petrologic techniques used to interpret the origin and evolution of igneous rocks. (a/y)

565 Metamorphism 3 (2-3) Prereq Geol 462. Metamorphic minerals, rocks, processes, and facies. Cooperative course taught at the University of Idaho (Geol 3565).

571 Geochemistry of Hydrothermal Ore Deposits 3 (2-3) Prereq Geol 470, 581 or 582. Ore formation in hydrothermal environments; sulfide mineral stability, water/rock interactions, and stable isotope relationships to altered rocks. Field trip required.

573 Advanced Topics in Economic Geology 2 May be repeated for credit. Prereq Geol 470. Ore-forming process or deposit type combining literature synthesis, theoretical evaluation and field trip inspection.

577 Advanced Groundwater Hydrology 3 Prereq Geol/C E 475. Groundwater flow systems; modeling and resource management. (a/y)

579 Hydrochemistry 3 Prereq Geol/C E 475. Chemical properties and chemical evolution of natural groundwater, chemistry of contaminated groundwater and monitoring technology. Cooperative course taught at the University of Idaho (Hydro 3565).

581 Petrologic Phase Diagrams 3 Interpretation of phase diagrams in igneous and metamorphic petrology. (a/y)

582 Mineral Equilibria 2 Mineral-solution equilibria in surface and near-surface environments. (a/y)

584 Isotope Geology 3 (2-3) Principles and applications of isotope geochemistry in the geological sciences.

585 Geochemical Exploration 3 (2-3) Principles and use of rapid chemical tests of rocks, soil, sediment, vegetation, or water samples in prospecting for mineral deposits. Cooperative course taught at the University of Idaho (Geol 3565).

586 Advanced Geochemical Exploration 3 (2-3) Colorimetric and instrumental analytical methods in mineral exploration, primary and secondary dispersion patterns, endogenic and exogenic behavior of individual elements. (a/y) Cooperative course taught at the University of Idaho (Geol 3565).

590 Photogeology 3 (1-6) Air photos for geologic information; elements of photogrammetry; map preparation and interpretation of stereo views, and oblique air photos. Cooperative course taught at the University of Idaho (Geol 3590).

591 Remote Sensing and Geologic Applications 3 (2-3) Graduate level counterpart of Geol 491; additional requirements. Credit not granted for both Geol 491 and 591.

592 Interdisciplinary Research Topics in Geology 3 May be repeated for credit; cumulative maximum 6 hours. Advanced topics across normal subject boundaries; tectonics and magma origin. 598 Graduate Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Prereq graduate student in Geol or related field. Papers presented by students, faculty, and visiting scientists on geological research.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit. 800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Schedule of Studies

At least 40 of the total hours required for a bachelor's degree must be in upper-division courses.

I. General University and Arts and Sciences Requirements

<table>
<thead>
<tr>
<th>Hours</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engl 101 English Composition*</td>
<td>3</td>
</tr>
<tr>
<td>Communication Proficiency</td>
<td>3</td>
</tr>
<tr>
<td>Humanities</td>
<td>6</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>6</td>
</tr>
<tr>
<td>Humanities or Social Sciences</td>
<td>9</td>
</tr>
<tr>
<td>Foreign Language 1 year (2 semesters) unless 2 years have been taken in high school.</td>
<td></td>
</tr>
</tbody>
</table>

*If grade is not B or above, Engl 201 must be taken.

II. Geology Requirements

Students are encouraged to discuss with their geology advisor modifications which may be made in the list of required courses to fit the needs of specialized interest.

<table>
<thead>
<tr>
<th>Hours</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geol 102 Physical</td>
<td>4</td>
</tr>
<tr>
<td>Geol 306 Introductory Petrology</td>
<td>3</td>
</tr>
<tr>
<td>Geol 308 Field Geol</td>
<td>4</td>
</tr>
<tr>
<td>Geol 310 Evolution</td>
<td>4</td>
</tr>
<tr>
<td>Geol 340 Geol Structures</td>
<td>4</td>
</tr>
<tr>
<td>Geol 350 Mineral and Crystalllography</td>
<td>4</td>
</tr>
<tr>
<td>Geol 355 Optical Mineralogy</td>
<td>3</td>
</tr>
<tr>
<td>Geol 461 Isotopes</td>
<td>2</td>
</tr>
<tr>
<td>Geol 462 Met Petrology</td>
<td>2</td>
</tr>
<tr>
<td>Geol 410 Paleontology</td>
<td>4</td>
</tr>
<tr>
<td>Geol 420 Sedimentary Petrology</td>
<td>3</td>
</tr>
<tr>
<td>Three courses from: Geol 403, 421, 430, 440, 470, 475, 480</td>
<td>8-10</td>
</tr>
</tbody>
</table>

III. Specific Outside Requirements

<table>
<thead>
<tr>
<th>Hours</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem 105, 106 Principles</td>
<td>8</td>
</tr>
<tr>
<td>Bio S Elective</td>
<td>3</td>
</tr>
<tr>
<td>Phys 201, 202 Classical Physics*</td>
<td>4</td>
</tr>
<tr>
<td>Math 171 Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>Math 172 or Cpt S 150 or 151</td>
<td>3-4</td>
</tr>
</tbody>
</table>

*Phys 101, 102 acceptable if taken before major is declared and grade is C or above.

Recommended Geology Electives: Geol 320, 321, 409, 491.


Minor in Geology

Geol 101 or 102, and 12 hours of upper-division credit in geology courses selected in consultation with a geology faculty advisor.

Preparation for Graduate Study

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: Geol 102, 308, 310, 340, 350, 355, 410, 420, 461, 462; one year of general physics; one year of general inorganic chemistry; mathematics through one semester of calculus.

Department of History


Offerings in the field of history may be classified as American, Asian, European, and Latin American.

A major in history can be used in government service, the new specialty of public history, 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 degree of Bachelor of Arts in History. Bachelor of Arts in Social Studies, Master of Arts in History, and Doctor of Philosophy. In cooperation with the Departments of English and Speech, the department participates in the interdisciplinary program in American Studies leading to the degree of Doctor of Philosophy.

Description of Courses

For explanation see Index under "Symbols"

Hist

101 [H] Classical and Christian Europe 3 Greece and Rome, birth of Christianity and Islam, Middle Ages, Renaissance, Reformation, religious wars, Louis XIV.

102 [H] Modern Europe 3 War, revolution, industrialization, culture—18th to 20th centuries; imperialism, democracy, and totalitarianism; Europe's leaders Napoleon to Hitler; Post-WWII confrontations.

110 [S] American History to 1865 3

111 [S] American History Since 1865 3

198 [S] History Honors 3

201 [K] Introduction to Asian American History 3 Same as APAS 201.

210 Topics in American History 3 May be repeated for credit; cumulative maximum 6 hours. Intensive and experimental study of special topics.

216 Main Currents in American Cultures 3 Same as Engl 216.

230 [S] Latin America, The Colonial Period 3

231 [S] Latin America, The National Period 3

*Open only to students in the Honors Program.
512 American Diplomatic History in the 20th Century 3 Graduate level counterpart of Hist 412; additional requirements. Credit not granted for both Hist 412 and 512.

513 Seminar in American Studies 3 May be repeated for credit. Same as Engsl 513.

515 Jeffersonian America 3 Graduate level counterpart of Hist 415; additional requirements. Credit not granted for both Hist 415 and 515.

516 Civil War and Reconstruction 3 Graduate level counterpart of Hist 416; additional requirements. Credit not granted for both Hist 416 and 516.

517 Rise of Modern America 3 Graduate level counterpart of Hist 417; additional requirements. Credit not granted for both Hist 417 and 517.

518 United States 1914-1941 3 Graduate level counterpart of Hist 418; additional requirements. Credit not granted for both Hist 418 and 518.

519 United States 1941-Present 3 Graduate level counterpart of Hist 419; additional requirements. Credit not granted for both Hist 419 and 519.

520 American Constitutional History 3 Graduate level counterpart of Hist 420; additional requirements. Credit not granted for both Hist 420 and 520.

521 The American Frontier 3 Graduate level counterpart of Hist 421; additional requirements. Credit not granted for both Hist 421 and 521.

522 History of the Pacific Northwest 3 Graduate level counterpart of Hist 422; additional requirements. Credit not granted for both Hist 422 and 522.

523 American Intellectual and Social History 3 Graduate level counterpart of Hist 423; additional requirements. Credit not granted for both Hist 423 and 523.

524 Seminar in American History 3 May be repeated for credit. Prereq. 12 hrs Hist.

526 Seminar in American Diplomatic History 3 May be repeated for credit. Research in American diplomacy and a survey of pertinent literature in the field.

527 Public History: Theory and Methodology 3 Graduate level counterpart of Hist 427; additional requirements. Credit not granted for both Hist 427 and 527.

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 non-traditional careers for historians.

530 Seminar in Modern European History 3 May be repeated for credit. Prereq 12 hrs Hist.

532 Historical Archaeology 3 Evolution and analysis of historical archaeological sites; cultural implications. Corequisite course taught at the University of Idaho (Anth 1D531).

534 Europe in the French Revolutionary and Napoleonic Era, 1789 to 1815 3 Graduate level counterpart of Hist 444; additional requirements. Credit not granted for both Hist 444 and 534.

548 Europe: War, Revolution, Nationalism 1815 to 1914 3 Graduate level counterpart of Hist 448; additional requirements. Credit not granted for both Hist 448 and 548.

549 Europe and Two World Wars, 1914-1945 3 Graduate level counterpart of Hist 449; additional requirements. Credit not granted for both Hist 449 and 549.

550 Europe: Postwar to Detente 3 Graduate level counterpart of Hist 450; additional requirements. Credit not granted for both Hist 450 and 550.

555 From the Tudor Revolution to the Glorious Revolution 3 Graduate level counterpart of Hist 455; additional requirements. Credit not granted for both Hist 455 and 555.

560 Modern Britain 3 Graduate level counterpart of Hist 459; additional requirements. Credit not granted for both Hist 459 and 560.

564 European Diplomacy Since 1914 3 Graduate level counterpart of Hist 461; additional requirements. Credit not granted for both Hist 461 and 564.

567 The Enlightenment 3 Graduate level counterpart of Hist 467; additional requirements. Credit not granted for both Hist 467 and 567.

568 Hitler and Nazi Germany 3 Graduate level counterpart of Hist 468; additional requirements. Credit not granted for both Hist 468 and 568.

573 Field Course in Modern European History 3 May be repeated for credit; cumulative maximum 9 hours. Readings and interpretive problems of European history.

576 Revolutionary China, 1800 to Present 3 Graduate level counterpart of Hist 476; additional requirements. Credit not granted for both Hist 476 and 576.

577 Modern Japanese History 3 Graduate level counterpart of Hist 477; additional requirements. Credit not granted for both Hist 477 and 577.

580 Historiography 3 Prereq 20 hrs Hist.

581 American Historiography 3

584 United States Foreign Relations 3 Graduate level counterpart of Hist 484; additional requirements. Credit not granted for both Hist 484 and 584.

585 American Political Thought 3 Graduate level counterpart of Hist 485; additional requirements. Credit not granted for both Hist 485 and 585.

590 Politics of Developing Nations 3 Graduate level counterpart of Hist 490; additional requirements. Credit not granted for both Hist 490 and 590.

595 The Teaching of History in College 1 Theory, problems, and methods of teaching history at the college level.

597 Seminar in History 2 or 3 May be repeated for credit.

598 History Internship V 2-12 Graduate level counterpart of Hist 498; additional requirements. Credit not granted for both Hist 498 and 598.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Schedule of Studies

At least 40 of the total hours required for the bachelor's degree in this program must be in upper-division courses. 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 the student will have completed courses meeting
General University and College of Sciences and Arts Requirements for graduation and should have completed the following:

Hist 100- or 200-level courses (12 hours)
Pol S 101 or 102
Three courses (9-10 hours) from the following:

Social Sciences: Anth 101; Econ 102 or 201; Soc 101; Pol S 206 or 222; Psych 101; one from APASI 201, Bl St 101, Ch St 110, Na Am 101, or W St 200;
Humanities: F A 201, 202, or 203; Hum 101, 202, 204, or 350; Phil 101, 201, 220, or 260.

At least one course must be taken from each area; teaching majors in history must take one course from the Social Sciences, one from the Humanities, and one from the Comparative American Cultures group (APASI, Bl St, Ch St, Na Am), W St 200, or an approved substitute from that group.

Junior Year

First Semester
- Hist 300- or 400-level
- Minor Elective
- Literature Elective (Engl or For L)
- Elective

Second Semester
- Hist 300- or 400-level
- Minor Elective
- Literature Elective (Engl or For L)
- Elective

Senior Year

First Semester
- Hist 300- or 400-level
- Minor Elective
- Electives

Second Semester
- Hist 300- or 400-level
- Minor Elective
- Electives

The 30 hours of history required must include 6 hours (any level) in each of these fields: United States, Europe, and other fields and areas (e.g., Latin America, Asia, Canada). At least one history seminar is required for a major.

SOCIAL STUDIES

Students desiring a teaching major in the social studies should see the teacher-education program outlined under Elementary and Secondary Education in this bulletin. Enrollment will be in the Department of History and the Department of Elementary and Secondary Education.

Teaching Majors in History

Students with a program in education who wish to acquire a teaching major in history should enroll in both the Department of History and in the Department of Elementary and Secondary Education while fulfilling the departmental requirements for a major in history.

Minor in History

A minor in history requires 16 hours, 8 of which must be in upper-division courses.

Preparation for Graduate Study

Students who have had basic undergraduate training in European and American 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 above schedule of studies.

Honors Program

V. N. Bhatia, Director

The primary objective of the Honors Program is to provide enriched educational opportunities for qualified students. The program offers a plan to promote an appreciative understanding of the physical and cultural world, and it is designed to supplement the more specialized training in the major field. It also provides the opportunity and the stimulus for students to develop their creative abilities.

The Honors Program is comprised of students from all departments and colleges who take honors courses throughout their undergraduate career. Each department or college, if it wishes, may offer special work for its students in addition to the University Honors courses.

Students who are not admitted to the Honors Program as incoming freshmen may petition to enter it any time after the end of their first semester but not later than the beginning of the junior year. For continued enrollment in the Honors Program, students must maintain an overall B average (3.00) and must maintain this same average in honors work. Students in the Honors Program are not required to complete the "General University Requirements for Graduation," except for the foreign language requirement, where it applies.

A student may drop the Honors Program at any time within existing university rules, and the honors courses taken will be applied toward the General University Requirements for Graduation. Students who satisfactorily complete all Honors Program requirements, earn a 3.00 grade point average in honors courses, and a cumulative grade point average of 3.00, will receive an Honors Certificate provided they have completed a minimum of 14 credits of Honors courses and seminars plus the required independent study. In addition, all students with a minimum of 30 semester hours of graded work at WSU will graduate cum laude if their cumulative grade point average for all WSU work is 3.30 but less than 3.80, or summa cum laude if the cumulative average is 3.80 or above.

Freshman students joining the Honors Program must take Eng 198 in the first semester, unless they are advised otherwise by the Director of the Honors Program. Students who are qualified to enroll in calculus (Math 171 or 172) are considered to have completed the minimum amount of mathematics required for the Honors Program. (Additional mathematics may be taken if the student wishes and must be taken if required by the student's major field.) Students not qualified to enroll in calculus should enroll in Math 199 or Phil 198 or an appropriate mathematics course.

Honors courses are open to students enrolled in the Honors Program. Other students may be permitted to enroll in individual classes by the Director of the Honors Program if space is available.

Description of Courses

For explanation see Index under "Symbols"

Anth 198 [S] Anthropology Honors 3
Bio 288 [B] Biological Science Honors 4
Chem 298 [P] Physical Science Honors 4
Econ 198 [S] Economics Honors 3
Engl 198 [W] English Composition Honors 3
Engl 199 [H] English Composition and Literature Honors 3
Hist 198 [S] History Honors 3
Hist 199 [H] Humanities Honors 3
Math 158 [Z] Mathematics Honors 3
Phil 199 [H] Philosophy Honors 3
Pol S 198 [S] Political Science Honors 3
Psych 198 [S] Psychology Honors 3
Soc 198 [S] Sociology Honors 3

U H

200 Sophomore Summer Reading Examination V 1-3 May be used to fulfill the independent study requirement for the Honors Program. Examination to be taken during first six weeks of first semester of sophomore year. Variable credit depending on extent and quality of summer reading.

300 Junior Summer Reading Examination V 1-3 May be used to fulfill the independent study requirement for the Honors Program. Examination to be taken during the first six weeks of first semester of junior year. Variable credit depending on extent and quality of summer reading.

330 Development of Western Civilization 3 Required of all Honors Program students in their junior or senior year.

350 Development of Eastern Civilization 3 Required of all Honors Program students in their junior or senior year.

410 Senior Student Reading Examination V 1-3 May be repeated for credit; cumulative maximum 6 hours. May be used to fulfill the independent study requirement for the Honors Program.

430 Foreign Study Practicum and Reports 2 By interview only. Special assignments and reports related to foreign study programs.

440 Domain of the Arts 3 Required of all Honors Program students in their junior or senior year.

500 Senior Thesis or Project V 1-4 May be repeated for credit. Thesis or project directed by student's major department.

506 Seminar 2 May be repeated for credit.

499 Special Problems V 1-4 May be repeated for credit.

Schedule of Studies

A bachelor's degree earned through the Honors Program ordinarily requires approximately the same number of total semester hours as required by the corresponding non-honors curriculum in the major field concerned. At least 40 of the total hours must be in upper-division courses. Honors Program students are required to complete the courses (or approved substitutes)
specified in the following schedule of studies. Honor Program students are strongly urged to gain a proficiency in a foreign language and to take advantage of the Study Abroad opportunities offered by Washington State University. (In five-year programs, the junior and senior years may be interpreted as I, IV, or V.)

In the first two years the student must take three of the following courses in social science: Anth 198, Econ 198, Hist 198, Pol S 198, Psych 198, Soc 198. The student must also take Phil 198 or Math 198, or an approved substitute if not enrolled in calculus or not qualified to enroll in it. Students are required to complete one of U H 460 Seminar or Hum 198. Honors students are required to complete three credits of independent study prior to their last semester. This may be done through Summer Reading (U H 200, 300, or 400), U H 499, or other approved arrangements.

Freshman Year

First Semester  Hours
Engl 198 Honors  3
Math 198 or Phil 198 (or appropriate mathematics course)  3
Dept Requirements or Electives  6-9

Second Semester  Hours
Engl 199 Honors  3
Social Science Honors  3
Dept Requirements or Electives  9

Sophomore Year

First Semester  Hours
U H 200 Summer Reading Exam  1-3
U H 460 or Hum 198  2-3
Chem 261 or Honors  4
Social Science Honors  3
Dept Requirements or Electives  9

Second Semester  Hours
U H 460 or Hum 198  2-3
Bio S 298 Honors  4
Social Science Honors  3
Dept Requirements or Electives  9

Junior Year

First Semester  Hours
U H 300 Summer Reading Exam  1-3
U H 460 or Hum 198  2-3
U H 330 Western Civilization  3
Dept Requirements or Electives  12

Second Semester  Hours
U H 460 or Hum 198  2-3
U H 350 Eastern Civilization  3
Dept Requirements or Electives  12

Senior Year

First Semester  Hours
U H 400 Summer Reading Exam  1-3
U H 460 or Hum 198  2-3
U H 440 Domain of the Arts  3
Dept Requirements or Electives  12

Second Semester  Hours
U H 460 or Hum 198  2-3
U H 450 Senior Thesis or Project (if required by dept)  1-4
Dept Requirements or Electives  12

Courses printed in Roman type are required for graduation; those in italics are optional.

Department of Horticulture and Landscape Architecture


Horticulture

Courses in horticulture are designed to give instruction in the principles and practices of fruit and vegetable production, turfgrass science, floriculture; and nursery management. Emphasis is given to the basic principles of plant production and management and understanding the fundamentals of plant growth and development upon which cultural practices are based. The curricula are designed to prepare men and women for work in the areas of fruit and vegetable production, turf and vegetable handling and processing, marketing and financial businesses, fieldman positions, state and federal departments of agriculture, and commercial nursery work, and related fields. Courses in ornamental horticulture prepare students for work in greenhouses, nurseries, and landscape management, florist and garden center operations, and private business. The programs prepare students to pursue graduate education as well.

The Department of Horticulture and Landscape Architecture offers an undergraduate minor in the area of fruit and vegetable production and ornamental horticulture.

An interdisciplinary curriculum in integrated pest management is available to those students whose interests span the areas of horticulture and pest management. The curriculum is described under the Adult and Youth Education section of this bulletin.

The department offers courses of study leading to the degrees of Bachelor of Science in Horticulture, Bachelor of Science in Landscape Architecture, Master of Science in Horticulture, and Doctor of Philosophy.

Description of Courses

For explanation see Index under "Symbols"

Horticulture

Hort

101 Plants and Gardens 3 (2-3) Plants and gardens for food, appreciation, and pleasure; fruits, vegetables, flowers, ornamentals, and native plants.
130 Interior Plants 3 Basic care and use of flowering and foliage plants in the home.
200 Introduction to Horticulture 2 Horticultural technology; implications and use of new techniques and tools in agriculture, cultivation, history, crops, plant classification, and aesthetics.
201 Introduction to Horticultural Science 4 (3-3) Prereq Hort 200. Fundamentals of plant growth and development at the cellular and whole plant levels as influenced by environment and management decisions.
231 Landscape Plant Materials 4 (3-3) Prereq Hort 101 or 201. Characteristics, ecology, nomenclature, identification, selection, and use of important woody and herbaceous landscape plant species.
232 Landscape Plant Materials II 3 (2-3) Prereq Hort 231. Continuation of Hort 231.
234 Controlled Environments for Horticultural and Biological Science 3 (2-3) Prereq Hort 201. Principles and practices for modifying environmental factors for horticultural production in controlled environments; methods for environmental measurements. Field trip required.
251 Plant Propagation 4 (2-6) Prereq Hort 101, Hort 201, Bot 120, or Bot 210. Principles and methods of multiplying herbaceous and woody plants and their handling up to useful size. Field trip required.
310 Pomology 3 (2-3) Prereq Hort 201. The principles and practices of deciduous tree fruit production.
312 Viticulture and Small Fruits 3 Prereq botany, biological science, or plant science course. Botanical relationships, plant characteristics, fruiting habits, location, culture, marketing, and utilization of grapes, berries, and other small or bush fruits. Field trip required. (a/y)
320 Olive Culture 3 Prereq Hort 201 or plant science course; Soils 201. Science, business, and art of vegetable crop production: culture, fertility, growth, physiology, handling, marketing; garden, commercial, greenhouse, tropical, specialty vegetables.
321 Olive Culture Laboratory 1 (0-3) Prereq q// in Hort 320. Production principles and practices of vegetable crops; plant characteristics, cultivars, nutrition, growth, and development.
331 Landscape Plant Installation and Management 3 (2-3) Prereq Hort 231, 232. Principles and practices for installation and management of landscape plantings; specifications, site preparation, transplanting, growth control, and diagnose of problems. (a/y)
332 Foliage Plants and the Development of Interior Spaces 3 (2-3) Prereq plant science and design. Design, selection, installation, and maintenance of plantings within buildings; identification, culture, and diagnosis of foliage plants; human responses to plantings. (a/y)
335 Nursery Practices and Management 3 (2-3) Prereq Hort 201, 234; Soils 201. Establishment and management of wholesale and retail nurseries. Field trip required. (a/y)
336 Commercial Flower Design and Retail Shop 3 (1-6) Prereq Hort 335. For Floriculture majors. Design and use in commercial shops; church and hall decorations; floral merchandising and supplies, store management and shop arrangement. (a/y)
356 Preparation for Entering the Horticulture Profession 1 Prereq junior in Hort. Resume writing; investigation of job opportunities; contact with employers; internship reports.
399 Professional Work Experience V 1-4 May be repeated for credit, cumulative maximum 8
hours. Prereq basic horticulture. By interview only. Planned and supervised work experience.

416 Advanced Horticultural Crop Physiology 3 Prereq Bot 320. Growth and development of horticultural crops; effect of mineral nutrition and environment on physiological processes.


418 Post-Harvest Biology and Technology 3 (2-3) Prereq Hort 201; Bot 320. Physical and physiological basis for handling and storage practices; perishable organ ontology and physiological disorders; post-harvest environment requirements. Field trip required.

419 Applications of Growth Regulators in Agriculture 1 Prereq Bot 320. Use of growth regulators to control germination, growth, flowering, fruiting, tuber and bulb formation, ripening, and senescence.

420 Potato Physiology and Production Technology 2 (1-3) Prereq Bot 320. Plant and tuber physiology; physical, chemical, physiological and technical concepts of production, storage, and processing of potatoes. Field trip required. Credit not granted for both Hort 420 and 520. (a/y)

425 Current Topics in Horticulture 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Hort 311, 320, or 234; Bot 320; GenCB 301. Classical, current scientific, and popular literature on horticultural topics.


445 Plant Breeding 3 Same as Agron 445.

456 Seminar 1 May be repeated for credit; cumulative maximum 2 hours. Current literature and special reports.

458 Tropical Crops 3 Prereq Bot 120; crop production course. Importance, history, harvest, and utilization of major, field, plantation, and horticulture crops of the tropics. (a/y)

469 Vegetable Seed Production 2 Same as Agron 469.

470 Potato Science 3 Prereq Hort 201. Origin, culture, harvesting, handling, storage, and marketing of the potato. (a/y) Cooperative course taught at the University of Idaho (PIsc ID470).

492 Instructional Practicum in Horticulture V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prereq junior or senior. By interview only.

496 Greenhouse Construction and Management V 1-3 Methods and materials used in greenhouse construction, environmental control, and management for greenhouse crop production. (SS)

499 Special Problems V 1-4 May be repeated for credit.

503 Environmental Physiology V 1-4 May be repeated for credit; cumulative maximum 8 hours. Prereq Bot 320. Advanced topics in the physiological effects of light, temperature, moisture, nutrition, and their management in plant productivity.

509 Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Continuous enrollment required for regularly enrolled graduate students in Hort. Recent developments in horticulture.

510 Graduate Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Literature reviews and research progress reports.

512 Advanced Pomology 3 Modern concepts, research, and commercial problems as reflected in current horticultural literature. (a/y)

516 Physiology of Growth I Prereq Bot 320. Physiological changes at the cellular level, cell elongation, interaction, and effect of hormones and growth retardants in controlling growth.

517 Physiology of Ripening and Senescence 1 Prereq Bot 320. Physiological changes during ripening, storage, and handling of fruits and senescence of leaves, flowers, and tubers.

520 Potato Physiology and Production Technology 2 (1-3) Graduate level counterpart of Hort 420; additional requirements. Credit not granted for both Hort 420 and 520. (a/y)

532 Plant Tissue, Cell, and Organ Culture 3 (2-3) Prereq Bot 320. Organ, tissue, and cell culture and morphogenesis and their contributions, both actual and potential, to current problems in plant science. (a/y)

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

### Schedule of Studies

#### HORTICULTURE

Students in horticulture may focus on fruits and vegetables or ornamental horticulture. At least 40 of the total hours required for the bachelor's degree in these programs must be in upper-division courses.

#### FRUIT AND VEGETABLE HORTICULTURE

##### Freshman Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>First Semester</td>
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<tr>
<td>Hort 200 Intro to Hort</td>
<td>2</td>
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<tr>
<td>Bot 120 Intro to Bot</td>
<td>4</td>
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<tr>
<td>Chem 101 or 105</td>
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<tr>
<td>Engl 101, AgHE 205, or SpCom 102</td>
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<td>Hum or Soc S Elective</td>
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<tr>
<td>Second Semester</td>
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<tr>
<td>Hort 201 Intro Hort Science</td>
<td>4</td>
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<tr>
<td>Chem 102 or 106</td>
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<tr>
<td>Engl 101, AgHE 205, or SpCom 102</td>
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<td>Hum or Soc S Elective</td>
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<tr>
<td>Electives</td>
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##### Sophomore Year

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<td>First Semester</td>
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<tr>
<td>Hort 234 Controlled Env</td>
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<tr>
<td>Hort 311 or Hort 320, 321</td>
<td>3-4</td>
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<tr>
<td>Chem 240 Elem Org Chem</td>
<td>4</td>
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<tr>
<td>Econ 201 or Ag Ec 201</td>
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<td>Hum or Soc S Elective</td>
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<tr>
<td>Hort 251 Plant Propagation</td>
<td>4</td>
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<tr>
<td>Soils 201 Soils</td>
<td>3</td>
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##### Junior Year

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<tr>
<td>PI P 429 Gen PI Path</td>
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<tr>
<td>Hort 311 or Hort 320, 321</td>
<td>3-4</td>
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<tr>
<td>Math 107 Precalculus</td>
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<tr>
<td>Hort 356 Hort Profess</td>
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<tr>
<td>Hort Elective</td>
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### ORNAMENTAL HORTICULTURE

#### Freshman Year

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<td>First Semester</td>
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<tr>
<td>Hort 200 Intro to Hort</td>
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<tr>
<td>Engl 101, SpCom 102, or AgHE 205</td>
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<tr>
<td>Chem 101 or 105</td>
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<td>Bot 120 Intro to Bot</td>
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<tr>
<td>Hort 201 Intro Hort Science</td>
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<td>SpCom 102, AgHE 205, or Engl 101</td>
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<td>Chem 102 or 106</td>
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#### Sophomore Year

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<tr>
<th>Semester</th>
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<tr>
<td>Hort 234 Controlled Env</td>
<td>3</td>
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<tr>
<td>Hort 311 or Hort 320, 321</td>
<td>3-4</td>
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<tr>
<td>Chem 240 Elem Org Chem</td>
<td>4</td>
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<tr>
<td>Econ 201 or Ag Ec 201</td>
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<tr>
<td>Hum or Soc S Elective</td>
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#### Junior Year

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<th>Semester</th>
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<td>First Semester</td>
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<tr>
<td>PI P 429 or 331</td>
<td>3</td>
</tr>
<tr>
<td>Hort 311 or Hort 320, 321</td>
<td>3-4</td>
</tr>
<tr>
<td>Math 107 Precalculus</td>
<td>3</td>
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<tr>
<td>Hort 356 Hort Profess</td>
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#### Second Semester

<table>
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<tbody>
<tr>
<td>Soils 441 Soil Fertility</td>
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<tr>
<td>GenCB 301 Gen Genetics</td>
</tr>
<tr>
<td>Entom 240 Ag Entomology</td>
</tr>
<tr>
<td>Hort Ornamental Elec</td>
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<tr>
<td>Computer Science</td>
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</tbody>
</table>
Department of Horticulture and Landscape Architecture

Second Semester
Hort Ornaments Elective** 3
L A 264 Basic Landscape Design 3
Entom 340 Ag Entomology 3
B A or Ag Ec Elective 3
Computer Science 3
Soils 441 Soil Fertility 3

Summer Session (or semester) Hours
Hort 399 Professional Work Experience 3

Senior Year
First Semester Hours
Hort Ornaments Elective** 2-3
Hort 311 or 313 3
Hort 320/321 Olericulture 4
Hort 418 Post-Harvest Biol 3
Ag M Elective 3
Elective* 1-3

Second Semester Hours
Hort Ornaments Elective** 2-3
Hort 417 Plant Pest Control 3
Hort 416 Crop Phys 3
Hort 425 Turf Topics 3
Elective* 1-3

*Electives must include an Intercultural Studies GUR and a computer science course.
**Ornamentals students must take at least 8 hours from Hort 331, 332, 335, 438, and 439

Minor in Horticulture
A minimum of 16 hours in Horticulture is required of which at least 8 hours must be in upper-division courses excluding Hort 399, 356 and 499. Hort 201 and 202 are required; Hort 251 is recommended.

Preparation for Graduate Study
Students with undergraduate majors in the plant sciences, including horticulture, agronomy, plant pathology, environmental science, genetics, plant physiology and biochemistry may be well prepared for graduate study in horticulture. Undergraduate students who are pursuing their studies at other institutions, or through other curriculums at this institution, and who contemplate graduate work in horticulture should take as many courses in the basic physical and biological sciences as possible.

LANDSCAPE ARCHITECTURE
Landscape architecture is the professional art and science of planning and designing resources of the land so that the activities of people are in harmony with their environment. The practice ranges in scale from the design of residential and garden landscapes to planning and design of complex projects such as cities and regions. The curriculum is accredited by the American Society of Landscape Architects (ASLA). It stresses a broadly based course of study emphasizing residential, community, and urban design; site, regional and land use planning, and professional practice methods. The curriculum is divided into two parts: Pre-Landscape Architecture and Landscape Architecture. The opportunity exists to participate in special studies, professional work experiences and foreign study.

Description of Courses
For explanation see Index under "Symbols"

Landscape Architecture
L A
202 [H] The Built Environment 3 Same as Arch 202.

260 History of Landscape Architecture 3 Historical developments in the practice and profession of landscape architecture throughout the world, circa B.C. to present.

262 Landscape Architectural Design I 3 (2-3) Prereq Arch 101, 102. Basic design and graphic techniques related to solving of elementary design problems.

263 Landscape Architectural Design II 3 (1-6) Prereq L A 262. Techniques for visualizing and designing landforms; application to design process; construction principles applied to design projects.

264 Basic Landscape Design 3 For non-majors. Design theory and principles; site design factors; design process application; design criteria; graphic communication; landform; circulation systems; plant uses.

299 Professional Work Experience: Contracting and Maintenance V 1-4 Prereq major in Pre.L A or L A. Planned and supervised professional work experience in landscape contracting and/or landscape maintenance.

361 Landscape Architectural Design III 4 (1-9) Prereq L A 263. Professional design and planning projects, residential, urban, regional, and open space issues.

362 Plants and Landscape Architectural Design IV 4 (2-4) Prereq Hort 232; junior in L A. Design projects; use of plant materials to solve spatial, horticultural, biological, aesthetic, and environmental problems. Field trip required.

363 Landscape Architectural Recreation Design V 4 (2-4) Prereq junior in L A. Principles and techniques for recreation planning and design at varying scales.

365 Landscape Architectural Construction I 4 (0-12) Prereq L A 263. Earthwork computations; surface and subsurface drainage systems; horizontal and vertical vehicular circulation; parking layout; construction materials; details; intermediate grading design.

366 Landscape Architectural Construction II 4 (0-12) Prereq L A 365. Cost estimating; reference filing; construction materials and detail design; construction specifications; advanced grading design projects.

399 Professional Work Experience: Office Practice V 1-4 May be repeated for credit; cumulative maximum 8 hours. Prereq junior or senior in L A. By interview only. Planned and supervised professional work experience in landscape architecture; office practice.

450 Principles and Practice of Planning 3 Same as R P 450.

467 Regional Landscape Inventory and Analysis 5 (2-9) Prereq. Bio S 104; Soils 201 or Geol 101. Application of ecological planning process for landscape inventory and analysis. Credit not granted for both L A 467 and R P 567.

468 Advanced Projects in Planning and Design 5 (1-2) Prereq. L A 467. Individual or group studio project in landscape architectural design or regional planning; exploring advanced techniques, methods and programming.

470 Senior Landscape Architectural Design VI 4 (2-4) Prereq senior in L A. Design, form giving, and presentation techniques—verbal, graphic, and written.

475 Senior Project Proposal 1 Prereq senior in L A. Program planning for senior project.

480 Professional Practice 1 Prereq senior in L A. Current business practices and project management techniques in the profession.

490 Planning and Design in Developing Countries 3 Same as R P 490.

492 Institutional Practice in Landscape Architecture V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prereq junior or senior. By interview only.

499 Special Problems 1-4 May be repeated for credit.

Schedule of Studies

PRE-LANDSCAPE ARCHITECTURE
Pre-Landscape Architecture (PreLA) is a two-year, non-degree course of study that is intended to prepare undergraduate students for the advanced professional curriculum in the upper division. The PreLA curriculum concentrates on General University Requirements (GURs) and basic professional courses. The completion of PreLA prepares the student to make application to the professional major in landscape architecture or entry-level technical positions in various landscape industries. Transfer students who have not completed the equivalent of the PreLA course work will be accepted directly into PreLA.

Freshman Year
First Semester Hours
Arch 101 Arch Graphics 3
Engl 101 Composition 3
FA 110 Drawing 3
Arts and Humanities GUR 3
Bio S GUR (w/lab) 4

Second Semester Hours
Arch 102 Arch Graphics 3
Science GUR 3
Soc S GUR 3
Hort 201 Intro L A 202 Built Environment 4

Sophomore Year
First Semester Hours
Hort 231 Plant Mat I 3
L A 260 L A History 3
L A 262 Design I 3
Communications GUR 3
Science GUR 3

Second Semester Hours
Hort 232 Plant Mat II 3
L A 263 L A Design 3
C E 101 Surveying 3
L A 365 Contract 1 4
Soils 201 Soils 3

General University Requirement (GUR) courses should be selected with the assistance of a Landscape Architecture adviser.

LANDSCAPE ARCHITECTURE
The professional four-year course of study is divided into two segments. These are Pre-Landscape Architecture (GURs above) and the third- and fourth-year professional Landscape Architecture program (L A). Completion of the four-year
program totaling 120 credits leads to the degree of Bachelor of Science in Landscape Architecture and allows the student to enter the profession. There are 40 upper-division credits required for graduation. 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.

To be admitted to the major of L.A., the student should have completed the PreLA curriculum and submitted an application. Application forms and instructions are available from the Admissions Office and the Department of Horticulture and Landscape Architecture Office. Applications to the professional program must be submitted prior to April 1. Due to limitations of space, faculty, and budget, admission can be granted to only the most qualified students based on experience, demonstrated abilities, motivation, and academic performance.

Transfer students who have completed the equivalent of the PreLA curriculum may apply to the professional program.

Junior Year
First Semester
L A 363 Rec Des V 4
L A 366 Contract II 4
FRM 301 or Bio S 372 3-4
Arts & Hum GUR 3

Second Semester
L A 361 Site Design 4
L A 362 Plants & Des IV 4
Ag M 346 Turf Irr Sys 1
Soc S GUR 1
Soils 371 Remote Sens 1
Electives 3

Senior Year
First Semester
L A 467 Land Inv Analysis 5
Soils 474 Terrain Analysis 3
L A 480 Prof Practice 2
L A 475 Sr Proj 1
L A 470 Senior Design VI 4

Second Semester
L A 468 Ad Plan Design 5
L A 450 Prin Prac Planning 3
Electives 8

Hotel and Restaurant Administration
PULLMAN CAMPUS

Director, T. Umbrett; Westin Distinguished Professor, D. Smith; Professor, L. Kreck; Associate Professor, K. Kendall.

This program provides specialized study of the major organizational and administrative problems of the hotel and restaurant industry. The program is intended to prepare graduates for the managerial opportunities available in the industry here and abroad. The curriculum provides for the well-rounded education of the hotel, restaurant, club, and institutional executive. It includes courses in the arts and sciences, economics, business administration, engineering, and foods, as well as in hotel and restaurant management. To be eligible for certification as a major in hotel and restaurant administration, students must have at least 40 semester hours credit and meet current cumulative g.p.a. and core business course g.p.a. standards. Current standards are published each year in the Catalog Supplement. The course of study leads to the degree of Bachelor of Arts in Hotel and Restaurant Administration.

Special Notice: Enrollment in 300- and 400-level Hotel courses is open only to juniors and seniors officially certified into degree programs that require these courses.

Description of Courses
For explanation see Index under "Symbols"

H A
181 Introduction 3 Historical development and organizational structure of the hospitality service industry.
235 Principles of Tourism 3 Underlying principles and practices in domestic tourism.
280 Lodging Systems and Procedures 3 Prereq H A 181; Acctg 230. Management functions relating to the planning and operational policies of various hotel departments.
310 Hospitality Industry Financial Control 3 Prereq H A 280; Acctg 231. Internal control through financial and accounting systems for hotels and restaurants.
320 Industry Experience 2 (6-0) Prereq H A major. Students work in various hospitality operations for 1,000 hours; work performance must be documented. Two supervised reports required.
350 Beverage Management 3 Not open to freshmen and sophomores. Beverage operations; detailed study of wines and spirits; consideration of social impacts such as trends in consumption.
356 Food and Beverage Systems Design and Analysis 3 Prereq H A 280; FSHN 102, 120. Management theory, problems, and cases in food and beverage operations, work methods; sanitation; research.
357 Food and Beverage Systems Control 3 Prereq H A 280; Acctg 231; Cpt S 105. Problems encountered in the management of food and beverage operations such as control and forecasting.
381 Hospitality Management and Organization 3 Prereq H A 181. Advanced management methods and concepts utilized in the administration of hospitality service industries.
435 Tourism 3 International and domestic tourism; effects of tourism on the society.
480 Marketing Strategy and Development 3 Prereq Mktg 360. Theory and practice; problems in guest relations, sales efforts, intramural promotion, research.
491 Operational Analysis 3 Prereq QMeth 215; Acctg 231; Sen 325. Using management tools in analyzing operational effectiveness of hotel and restaurant organizations.
496 Case Studies and Research 3 Prereq H A 357, 491. Use of the case method and computerized statistical programs in the analysis of administrative practices of organizations.
497 Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. By invitation only. Selected topics.
499 Special Topics V 1-3 May be repeated for credit; cumulative maximum 6 hours. Topics of special interest within the area of hotel and restaurant administration.

Hotel and Restaurant Administration
V 1-12 By interview only. Prereq major in H A. Internship with hotel and restaurant organizations in professional and managerial activities.

498 Internship in Hotel and Restaurant Administration V 1-12 By interview only. Prereq major in H A. Internship with hotel and restaurant organizations in professional and managerial activities.

501 Hospitality Services Marketing 3 Prereq Mktg 505. Services marketing concepts and principles applied to hospitality organizations; strategies to market services and control quality.

501 Hospitality Services Management 3 Prereq Mgt 501. Design and management of service systems in hospitality operations; control of customer interaction, personnel activities and inventory.

Schedule of Studies

PULLMAN CAMPUS

At least 40 of the total hours required for this degree must be in upper-division courses. More than 40 percent of the work must be in subjects other than business, economics, and hotel and restaurant administration.

Hotel and Restaurant Administration: H A 181, 280, 320, 356, 357, 381, 480, 491, 495; H A electives—6 hours.

General: Engl 101, 201, SpCom 102, Math 201, 202, Cpt S 105, lab science, science elective, humanities (6 hours), intercultural studies (3 hours), social sciences (6 hours), FSHN 102 (not required for SCHRA), 120.


Economics: Econ 102, 203, 350. Economics courses that satisfy departmental requirements in business may not be used to satisfy GURs.

Transfer Students

A student planning to transfer to hotel and restaurant administration from a two-year program should have made satisfactory academic progress before transferring. In addition, the student should have 500 hours (one semester) of gainful employment in the hospitality industry. However, it is strongly advised that the student utilize both summers in related employment before entering WSU.

SEATTLE CAMPUS

Assistant Professor and Director, D. L. Whitney; Professor, B. H. Booms; Associate Professor, D. G. Rutherford.

WSU Seattle Center Hotel and Restaurant Administration, 1108 E. Columbia, Seattle, Washington 98122 (Seattle University Campus).

This program is offered on the quarter system. Students must have 90 quarter hours to enter the degree program, 85 of which are applicable toward graduation. Students who wish to enter the degree program may transfer the first two years' work from any accredited community college or four-year college. Persons in industry or other interested parties who wish to further their education but do not want to pursue a degree, are welcome to enroll in courses for a limited number of credits on a space available basis.

121
Program in Literary Studies

Description of Courses

For explanation see index under "Symbols"

Credits are shown as quarter hours.

HAS

201 Quantity Food Production 5 Principles of menu writing, sanitation and food preparation applied to management of quantity food production and service.

235 Principles of Tourism 5 Underlying principles and practices in domestic tourism.

285 Lodging Systems and Procedures 5 Introduction to hospitality industry; historical development of various types of food, lodging facilities; organization and functions of hotel operating departments.


311 Law in Innkeeping 3 Prereq: Law 210. The case method is utilized in treating subjects such as innkeeper’s lien, torts, and crimes against innkeepers.

315 Managerial Economics in Service Industries 5 Prereq Econ 102, 203. Economics of the firm; economic tools and formal decision making applied to cash flow, resource allocation, and cost minimization.

320 Industry Experience 3 Students work 1000 hours in hospitality industry; supervised reports required.

350 Beverage Management 5 Not open to freshmen and sophomores. Beverage operations; detailed study of wine and spirits; consideration of social impacts such as trends in consumption.

356 Food and Beverage Systems, Design and Analysis 5 Management theory, problems and cases in food and beverage operations work methods, food facility design and sanitation safety.

357 Food and Beverage Systems Control 5 Prereq HAS 356. Problems encountered in the management of food and beverage operations such as control and forecasting.

370 Building and Maintenance Management 5 Prereq HAS 270. Problems involved with the utilization of energy in hotels and direction of energy management program.

375 Club Management 3 The identification of managerial problems unique to club operations and their potential solutions.

381 Hospitality Management and Organization 5 Prereq: HAS 285. Advanced management methods and organization behavior concepts utilized in the administration of hospitality service industries.

385 Applied Personnel Management 3 Functional areas of personnel planning, selection, training, evaluation and wage and salary administration related to the hospitality industry.

386 Applied Industrial Relations 3 Labor relations; history, organization, and elections of bargaining agents, negotiation and administration of contracts.

435 Tourism 5 International and domestic tourism; effects of tourism on the society.

478 Research in Hospitality Industry 5 Prereq QMeth 215; Cpt S 105. Utilizing statistical analysis in strategy formulation.

480 Marketing Strategies and Development 5 Theory and practice; problems in guest relations, special sales efforts, intramural promotion, research.

491 Operational Analysis 5 Prereq 3 courses in accounting/finance. Financial management for the hospitality industry; financial, operational, and managerial analysis and control.

492 Service Operations Management 5 Design and management of service delivery systems through operations management topics from a service perspective.

495 Case Studies and Research 5 Prereq HAS 381. Use of the case method and computerized statistical programs in the analysis of administrative practices of organizations.

496 Seminar V 1-5 May be repeated for credit; cumulative maximum 10 hours.

497 Special Topics V 1-5 May be repeated for credit; cumulative maximum 10 hours. Topics of special interest within the area of hotel and restaurant administration.

499 Special Problems V 1-5 May be repeated for credit.

Schedule of Studies

SEATTLE CAMPUS

The Bachelor of Arts degree in Hotel and Restaurant Administration requires a total of 180 quarter hours. At least 60 of the total hours required for this degree must be in upper-division courses. For general courses and core courses, see Pullman Campus.

Hotel and Restaurant Administration Requirements

HAS 285, 320, 356, 557, 381, 480, 491, 494, 495; HAS electives 11 hours.

Humanities Courses

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, 202, and 204 provide a survey of Western Civilization from ancient times to the twentieth century.

Description of Courses

For explanation see Index under "Symbols"

Hum

101 [H] Humanities in the Ancient World 3 Integrated humanities: literature, history, philosophy, and art of the Ancient World.

103 [100] [H] Mythology 3 The theory of mythology and use of myths in art, literature, and music; Graeco-Roman and one other.

110 [H] World Civilizations I, Origins to 1500 3 Integrated study of social, political, and philosophical/religious systems in early civilizations, with an introduction to distinctive art forms.

111 [H] World Civilizations II, 1500 to Present 3 Integrated study of social, political, and philosophical/religious systems in modern civilization; distinctive art forms of the major world civilizations.


202 [H] Humanities in the Middle Ages and Renaissance 3 Integrated humanities: literature, philosophy, history, and art of the Middle Ages and Renaissance.


211 Topics in Humanities 3 Study Abroad (London).

222 Topics in Humanities 3 Study Abroad (Agnon).

223 Topics in Humanities 3 Study Abroad (Cologne).

224 Topics in Humanities 3 Study Abroad (Gualajara).

310 [G] Eastern Civilization and Literature 3 Same as For L 310.

321 Topics in Humanities 3 Study Abroad (London).

322 Topics in Humanities 3 Study Abroad (Agnon).

323 Topics in Humanities 3 Study Abroad (Cologne).

324 Topics in Humanities 3 Study Abroad (Gualajara).

335 [H] The Bible as Literature 3 Same as Eng 335.

499 Special Problems V 1-4 May be repeated for credit.

Program in Literary Studies

Offered jointly by the Department of English and the Department of Foreign Languages and Literatures, the program in Literary Studies is designed to give the student an appreciation of literature as a phenomenon both transcending and subject to national and linguistic boundaries. The doctoral degree to which the program leads is conceived—due allowance being made for the fact that knowledge of one's native language is likely to remain supreme—as requiring equal proficiency in English and its literature and one foreign language and its literature, accompanied by a lesser degree of proficiency in a second foreign language and its literature. At times the student may be advised to enroll in appropriate courses offered by other departments, such as History, Philosophy, or Speech. Students will also be expected to acquaint themselves with a selected group of the world's classics which fall outside their chosen area of study.

Thus the Program in Literary Studies is designed to encourage the breadth of understanding which an acquaintance with literature at large, as well as a detailed knowledge of several specific literatures, should afford. Its purpose is to graduate well-rounded, mature, and creative scholars equipped to teach in departments of English, foreign languages, or comparative literature, and ready to participate in general programs in the humanities. Graduates of the program should be well prepared also for responsible positions in university or research libraries. A complete description of the program will be found in the Graduate Study Bulletin of Washington State University.

1Open only to students in the Honors Program
The Department of Pure and Applied Mathematics provides undergraduate instruction and training in all major fields of mathematics. The numerous service courses taught by the department reflect the growing importance of mathematics in an increasing number of other disciplines.

In addition to the traditional curriculum for mathematics majors, options have been developed specifically to prepare students for careers in applied analysis, operations research, computational mathematics, applied statistics, actuarial science, and secondary mathematics teaching.

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.

Graduate study and specialization are offered by the department in the usual classical and a number of modern areas. A Doctor of Arts program is specially designed for future college teachers, while the several options in applied mathematics, which include an internship experience, provide graduate preparation for mathematical careers in business and industry. The mathematics department runs a computing laboratory containing several microcomputers, an analog-to-digital computer, and related mathematical tools. In addition, research is conducted using the department’s own VAX 11/750 mini-computer.

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 and a Spitz planetarium.

The mathematics library receives current copies of over 300 journals in many languages. It also has sets of collected works and an extensive collection of advanced treatises.

Talented undergraduate majors in mathematics are given individual and small group instruction outside of class, sometimes resulting in research publications.

Entering freshmen whose preparation is sufficiently good, as determined by high school records and other evidence, will be permitted to enroll directly in college courses for which they are qualified. Upon satisfactory completion of such a course, they may receive advanced placement credit for certain of the prerequisite mathematics courses.

The department offers courses of study leading to the degrees of Bachelor of Science in Mathematics, Master of Science in Mathematics, Doctor of Arts, and Doctor of Philosophy.

**Description of Courses**

*For explanation see Index under "Symbols"

**Math**

101 Intermediate Algebra 3\; Prereq; appropriate math placement score. Fundamental algebraic operations and concepts.

103 [Z] Statistical Thinking 3 Prereq; 2 yrs HS algebra or Math 101. Scientific explanation; correlations and causality; presenting statistical evidence; graphical and numerical methods; chance and gambling; the bell-shaped distribution.

107 Precalculus Algebra 3 Prereq Math 101 or satisfactory math placement score. Functions and graphs, theory of equations, conic sections, logarithms, and exponentials.

108 Precalculus Trigonometry 2 Prereq Math 101 or satisfactory math placement score. Trigonometry, complex numbers, and discrete mathematics.


171 [Z] Calculus 1 4 (3-2) Prereq Math 107, 108, or satisfactory math placement score. Differential and integral calculus of one variable with associated analytic geometry. Credit not normally granted for more than one of Math 140, 171, 202, and 206.

172 Calculus II 4 (3-2) Prereq Math 171. Techniques and applications of one variable integral calculus; estimations; series, derivative of a vector function.

198 [Z] Mathematics Honors 3 Credit not granted for both Math 116 and 198.

200 (105) Mathematics for Elementary Education 3 Prereq; 2 yrs HS algebra or Math 101. Problem solving, concepts, operations, and algorithms of whole numbers, integers, and rational numbers; measurement; ratio and proportion; graphs.

201 Introduction to Finite Mathematics 3 Prereq Math 101 or satisfactory math placement score. Basic notions of logic, linear algebra, matrices and analytic geometry; applications to linear programming. Credit not normally granted for both Math 201 and 220.

202 [Z] Introduction to Mathematical Analysis 3 Prereq Math 107 or satisfactory math placement score. Differential and integral calculus of the polynomial, exponential, and logarithmic functions. Credit not normally granted for more than one of Math 140, 171, 202, and 206.

206 [Z] Mathematical Analysis for Architects 3 Prereq Math 107, 108, or satisfactory math placement score. Calculus of elementary functions; trigonometry; applications to architecture. Credit not normally granted for more than one of Math 140, 171, 202, and 206.

216 (S16) Discrete Structures 3 Same as Cpt S 216.

220 Introductory Linear Algebra 2 Prereq Math 171 or c/c. Elementary linear algebra with geometric applications. Credit not normally granted for both Math 201 and 220.

273 Calculus III 2 Prereq Math 172; 220 or c/c. Calculus of functions of several variables.

300 Mathematics for Elementary Education II 3 Prereq Math 200. Concepts of Math 200. Discovery; problem posing and solving; concrete embodiments of mathematical concepts; calculators and computers; probability and statistics; informal geometry.

302 Theory of Numbers 3 Prereq Math 172, 220. Divisibility; properties of integers; congruences; Diophantine equations; quadratic residues.

303 Higher Geometry 3 Prereq Math 220. Geometry as a deductive system of logic, postulational systems; projective and non-Euclidean geometries.

315 Differential Equations 3 Prereq Math 172, 220. Linear differential equations and systems; series, numerical and qualitative approaches; applications.

320 Elementary Modern Algebra 3 Prereq Math 220. Algebra as a deductive system; number systems, groups, rings, and fields.

325 Elementary Combinatorics 3 Prereq Math 220. Introduction to combinatorial theory and graph theory with applications to economics, computer science, and network theory.


364 Principles of Optimization 3 Prereq Math 202 or 220. Algebra of linear inequalities; duality; graphs, transport networks; linear programming; special algorithms; non-linear programming; selected applications.

371 Introduction to Analysis 3 Prereq Math 273, 315. Completeness of real numbers, the theory of integration and differentiation, sequences of functions, Taylor’s formula, power series.

375 Vector Analysis 3 Prereq Math 273, 315. Line integrals, gradient, curl, divergence, Stokes’ theorem, potential functions.

398 Mathematical Snapshots 1 Prereq Math 172. Character, life work, and historical importance of mathematicians from various eras and branches of mathematics.

408 Mathematics for Economists 3 Prereq Math 201, 202. Mathematical topics applicable to modern economic analysis and research.

410 Theory of Functions of a Complex Variable 3 Prereq Math 273, 315. Cauchy’s theorem; Taylor and Laurent series; calculus of residues; conformal mapping; special functions applied to engineering and physical sciences.

415 Intermediate Differential Equations 3 Prereq Math 315. Linear systems; qualitative theory (existence, uniqueness, stability, periodicity); boundary value problems; applications.

417 Introduction to Simulation 3 Same as QMeth 417.

420 Linear Algebra 3 Prereq Math 220. Advanced topics in linear algebra including similarity transformations, canonical forms, dual spaces, Hermitian matrices, bilinear forms.
Joint listing with the University of Idaho (Math ID571A).


507 Advanced Theory of Numbers 3 May be repeated for credit. Prereq Math 105, or Bio S 430, or CSE 172. Number theory, including algebraic number theory and analytic number theory.


509 Foundations of Mathematics 3 The basis of mathematics in logic and set theory; continuum hypothesis; Godel’s theorems, recent developments. (a/y)

512 Ordinary Differential Equations 3 Prereq Math 371. Existence of solutions; linear systems; qualitative behavior, especially stability; perturbative solutions. Joint listing with the University of Idaho (Math ID539).

525 General Topology 3 Prereq Math 371. Graduate level counterpart of Math 425; additional requirements. Credit not granted for both Math 425 and 525. Joint listing with the University of Idaho (Math ID511).

526 Advanced Topology 3 Prereq Math 421; Math 425 or 525. General topology; basic ideas of algebraic topology. Joint listing with the University of Idaho (Math ID512).

527 Algebraic Topology 3 Prereq Math 526. Basic homotopy theory and application. (a/y) Cooperative course taught at the University of Idaho (Math ID523).

528 Algebraic Topology 3 Prereq Math 527. Continuation of Math 527. (a/y) Cooperative course taught at the University of Idaho (Math ID524).

538 Topics in Modern Astrophysics 3 May be repeated for credit; cumulative maximum 9 hours. Same as Astr 538.

539 Group Representation Theory and Applications 3 Prereq Phys 402 or 406 or Chem 531; Math 420. Group theory, matrix groups, group representations and applications from physics and chemistry.


544 Computational Linear Algebra 3 Prereq FORTRAN programming course; Math 220; Math 448 or CSE 330. Numerical solution of linear systems of equations; linear least squares problems; matrix eigenvalue and eigenvector computation; error analysis.


550 Advanced Topics in Geometry 3 Projective, affine, and non-Euclidean geometries and their relation to abstract algebra and differential geometry. (a/y)

551 Groups and Topological Groups 3 May be repeated for credit. Prereq Math 421, 425. Group theory and theory of topological algebraic structures. (a/y) Joint listing with the University of Idaho (Math ID553).

552 Galois Theory 3 Field extensions, automorphisms, normality, splitting fields, radical extension, finite fields, separability, (a/y) Cooperative course taught at the University of Idaho (Math ID552).

553 Ring Theory 3 Ideals, quotient rings, modules, radicals, semi-simple Artinian rings, Noetherian rings. (a/y) Cooperative course taught at the University of Idaho (Math ID551).

554 Linear Algebra 3 Prereq Math 420. Vector spaces, direct sums, quotient spaces, similarity, Jordan forms, inner products, eigenvalues, eigenvectors, spectral theory. (a/y) Cooperative course taught at the University of Idaho (Math ID550).

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.

564 Topics in Optimization 3 May be repeated for credit. Prereq Math 421, 468, 544, CSE 315. Advanced topics in the theory and computing methodology in optimization with emphasis on real-life algorithmic implementations.


581 Seminar in Analysis 3 May be repeated for credit. Joint listing with the University of Idaho (Math ID541A).

582 Seminar in Algebra 3 May be repeated for credit. Joint listing with the University of Idaho (Math ID561).

583 Seminar in Applied Mathematics 3 May be repeated for credit.

584 Seminar in Topology and Geometry 3 May be repeated for credit.

585 Seminar in Number Theory 3 May be repeated for credit. (a/y)

586 Topics in Mathematical Modeling in Natural Sciences 3 May be repeated for credit; cumulative maximum 12 hours. Selected topics in the mathematical modeling of physical and biological phenomena.

590 Seminar in Undergraduate Mathematics Instruction 3 May be repeated for credit; cumulative maximum 6 hours. Curricular and other problems of teaching mathematics to undergraduates.


592 Seminar in the History of Mathematics 1 Topics in the history of mathematics from 1800 to present.

600 Special Projects or Independent Study Variable credit.

602 Internship 0-2 May be repeated for credit. (a) 40 hr graduate work. A structured internship from 3-9 months; teaching at the postsecondary level or applied work in a non-academic environment.

700 Master’s Research, Thesis, and/or Examination Variable credit.

702 Master’s Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.
Department of Mechanical and Materials Engineering


MECHANICAL ENGINEERING

The mechanical engineering program 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 are available for participation in mechanical design, systems design, equipment development, manufacturing, CAD/CAM, project engineering, production management, applied research and sales and service.

The curriculum emphasizes courses fundamental to all aspects of mechanical engineering and there is an opportunity to take elective courses to strengthen a student's background or to pursue special interests. 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. An integrated BS/MS program facilitates the completion of a master's degree in one additional year beyond the bachelor's degree.

The department 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), and participates in the interdepartmental program leading to the degree of Doctor of Philosophy (Engineering Science).

MATERIALS SCIENCE AND ENGINEERING

Materials Science and Engineering is the application of methods and principles of the pure sciences to the study and utilization of engineering materials. In the undergraduate program, the student is introduced to the broad concepts of materials science and engineering through their application to physical metallurgy. Metallurgy is the study and utilization of metals as engineering materials. Physical metallurgy deals primarily with the nature and properties of metals and alloys as they are used, rather than with their extraction from ores. This involves a study of the mechanical, chemical, and physical properties of metals, their crystal structure, their equilibrium behavior, and their utilization in engineering practice.

The specific fields of application covered by research and instructional programs can be expressed by the nominal designations of metals (metallurgy), polymers, ceramics, wood, and composites. For purposes of analysis, study in these disciplines may be placed on a generalized basis by dividing them into the following areas of materials science: (1) structural nature of materials, (2) thermodynamics and phase equilibrium, (3) phase transformations in metals, (4) mechanical properties of materials, (5) physical properties of materials, and (6) chemical properties of materials. Because of the diversity of useful properties encountered in materials engineering, attention must also be given to the application and peculiarities of specific materials types. Where possible, however, a generalized approach toward the study of materials, their properties, their selection, and their utilization is fostered.

The department offers courses of study leading to the degree 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 department participates in the interdepartmental program leading to the degree of Doctor of Philosophy (Engineering Science).

Description of Courses

For explanation see Index under "Symbols"

Mechanical Engineering

M E

101 Graphic Design 2 (1-3) Orthographic theory, conventions, and visualization; isometric and oblique pictorials; introductory engineering design considerations.

120 Descriptive Geometry 2 (1-3) Prereq M E 101. Graphical analysis and solution of spatial problems from all engineering fields; visualization and communication skills.

212 Systems Design 2 Prereq Math 172; Cpt S 203 or c/; Phys 201 or c/. Application of design and experimentation to mechanical engineering problems.

301 Fundamentals of Thermodynamics 3 Prereq Phys 201; Math 315 or c/. Thermodynamic properties of matter, ideal and real gases, work and heat, first and second laws and their application to engineering systems.

302 Thermodynamic Systems 3 Prereq Chem 106; M E 301; major in engr. Power and refrigeration cycles, thermodynamic relations, mixtures and solutions, reacting systems and applications to combustion processes; phase and chemical equilibrium.

303 Fluid Dynamics 3 Prereq M E 301; major in engr. Laminar and turbulent flow of ideal and viscous fluids; pipe flow; boundary layers; wing theory; supersonic flow; nozzles, shock waves. Joint listing with the University of Idaho (ES ID320).

305 Laboratory II 1 (0-3) Prereq M E 302 or 303 or c/; major in engr. Experiments related to principles of compressible and incompressible fluids, thermodynamics, and thermodynamic cycle components.

310 Manufacturing Processes 3 Prereq M E 301; major in engr. Cutting operations, metal forming by deformation, material fabrication, and nontraditional processing.

311 Manufacturing Processes Lab 1 (0-3) Prereq M E 301, M E 310 or c/; major in engr. Laboratory experience in basic manufacturing techniques.

312 Kinematic Analysis 3 (2-3) Prereq C E 212; major in engr. Motion transfer; velocity, acceleration, and inertia forces in machines.
static and dynamic force systems; cam profiles; gears and geared systems. Joint listing with the University of Idaho (ME ID324).

313 Engineering Analysis 3 Prereq Math 315; Cpt S 203; major in engr. Analysis and modeling of engineering problems utilizing numerical and geometrical techniques and the computer, including the analog computer. Joint listing with the University of Idaho (ME ID380).

315 Fabrication and Materials Laboratory 2 (1-3) Prereq C E 314. Materials properties and fabrication techniques; laboratory examples from mechanics of materials; manufacturing techniques numerical control. (SS)

320 Materials Laboratory 1 (0-3) Prereq C E 314 or c/c; major in engr. Mechanical behavior of materials and application to engineering structures.

348 Dynamics Systems 3 Prereq M E 312; major in engr. Fundamentals of vibration analysis, control systems, system modeling and dynamics analysis.

349 Dynamic Systems Laboratory 1 (0-3) Prereq M E 348 or c/c. Laboratory investigations of dynamic systems.

404 Heat Transfer 3 Prereq M E 303; major in engr. Conduction, radiation, and convection heat transfer; analytical, numerical, experimental results for solids, liquids, and gases; heat exchanger design. 

406 Laboratory III 3 (1-6) Prereq M E 305; 404 or c/c; major in M. I. E. Investigations involving solid-body mechanics, heat transfer, and fluid mechanics.

414 Machine Design 3 Prereq C E 314; M E 320; major in engr. Optimal design of machinery; analysis for prevention of machine elements failure.

416 Design of Engineering Systems 3 (1-6) Prereq MSE 301; M E 312, 414; major in M E or E E. Design of mechanical systems integrating thermal sciences and solid-body mechanics aspects.

417 Design of Thermal Systems 3 (1-6) Prereq M E 404 or c/c; major in M E or E E. Detailed design of thermal power systems.

419 Air Conditioning 3 Prereq M E 302, 404. Principles of heat and moisture transfer; air motion and purity in buildings; design of systems.

424 Flow of Compressible Fluids 3 Prereq M E 301, 303. Quasi-one-dimensional flow, shock waves, unsteady one-dimensional flow and steady two-dimensional flows. Joint listing with the University of Idaho (ME ID412A).

435 Thermal Systems 3 Prereq M E 302; M E 404 or c/c. Thermal systems of current interest in processes and power industries; combustion, cryogenics, direct energy conversion, nuclear power.

436 Combustion Engines 3 Prereq M E 302. Internal combustion engines; spark ignition engines, diesels, and gas turbines.

439 Applied Aerodynamics 3 Prereq C E 315 or M E 303. Aerodynamic lift and drag; circulation; boundary layers, application to vehicle and structural design and pollution control.

442 Rotorcraft 3 Same as E E 442.

449 Mechanical Vibrations 3 Prereq M E 313; major in engr. Damped and undamped systems of single and multi-degrees of freedom; transmissibility; isolation; log decrement; energy methods; applications. Joint listing with the University of Idaho (ME ID472).

470 Kinematic Synthesis 3 Prereq M E 312. Analytical and graphical techniques applied to the analysis and synthesis of planar mechanisms. Credit not granted for both M E 470 and 570.

472 Mechanical Systems Design 3 Prereq M E 414. Assessment of performance and detail design of selected mechanical components, concepts and assemblies. Credit not granted for both M E 472 and 572.

473 Computer Aided Design 3 Prereq Cpt S 203; M E 313; major in engr. Interactive computer programming and graphics in the design of engineering systems. Joint listing with the University of Idaho (ME ID404).

474 Advanced Manufacturing Process 3 Mechanical and metallurgical fundamentals of machining and materials processing by conventional and non-conventional methods. Credit not granted for both M E 474 and 574.

475 Manufacturing Automation 3 (2-3) Prereq M E 310; Cpt S 203. Computer control of manufacturing processes; numerically controlled machine tools, control algorithms, component and system design. Credit not granted for both M E 481 and 581.

480 Industrial Internship 3 Prereq M E 348. Analysis and design of feedback control systems. Credit not granted for both M E 481 and 581.

489 Internship in Mechanical Industry 2 May be repeated for credit; cumulative maximum 6 hours. Prereq major in M E or MSE. By interview only. Students work full time on engineering assignment in approved industries with industrial and faculty supervision.

499 Special Problems V 1-4 May be repeated for credit.

510 Macroscopic Thermodynamics V 2-3 Advanced thermodynamics from macroscopic viewpoint; basic postulates, equilibrium, stability, property relations; application to thermal-fluid and solid mechanics; irreversible thermodynamics. Joint listing with the University of Idaho (ME ID524).

511 Microscopic Thermodynamics V 2-3 Microscopic development of equilibrium; classical and quantum particle statistics; statistical description of real and ideal gases, solids, and liquids. Joint listing with the University of Idaho (ME ID522).


514 Thermal Radiation Processes 2-3 Prereq M E 303. Thermal radiation within enclosures, ideal and real surfaces; radiative processes within absorbing/emitting media; applications to furnaces, solar energy systems. Joint listing with the University of Idaho (ME ID547).

515 Convective Heat Transfer V 1-3 Prereq M E 521. Derivation of the energy conservation equation; laminar and turbulent forced convection heat transfer with internal and external flow; free convection. Joint listing with the University of Idaho (ME ID546).

521 Fundamentals of Fluids 4 Prereq M E 303. Fundamentals of mass momentum and energy, with tensorial development of governing equations; boundary layer flows. 

522 Viscous Flow 3 May be repeated for credit; cumulative maximum 3 hours. Prereq M E 521. Properties of real fluid flow, solutions of Navier-Stokes equations, concepts of the boundary layer, transition and turbulence. Joint listing with the University of Idaho (ME ID520A).

525 Kinematics of Ideal Fluids 2 Prereq Math 440. Potential flow over cylinders, airfoils; vortex motion and kinematics of vortex induced flows. (a/y)


531 Deformation and Fracture of Solids 3 Prereq M E 530. Theory of inelastic behavior of engineering materials; macroscopic plasticity, viscoelasticity, ductile and brittle fracture.

533 Finite Elements 3 Same as C E 532.


536 Mechanics of Composite Materials 3 Prereq C E 314; Math 315. Mechanical and macromech behavior; prediction of properties; stiffness and strength theories; laminated beams and plates; dynamic behavior; environmental effects. Cooperative course taught at the University of Idaho (ME ID536).

540 Advanced Dynamics 3 Prereq M E 303. Newtonian dynamics, rotating coordinate systems; Lagrangian and Hamiltonian mechanics; gyroscopic mechanics, other applications. Joint listing with the University of Idaho (ME ID505).

541 Advanced Mechanical Vibrations V 2-3 Prereq M E 449. Response of single and multi degree of freedom systems; finite element formulation; matrix methods, random vibrations. (a/y) Joint listing with the University of Idaho (ME ID550).

542 Control of Dynamic Systems 3 Introduction to optimal control theory, differential games, and multiple criteria systems. Applications in engineering, biology, economics, agriculture, and medicine.

548 Acoustics 3 Prereq M E 530. Fundamental principles of linear and non-linear acoustics and its applications. (a/y)


551 Turbulent Flow 3 Prereq C E 315 or M E 303. Theories of turbulent motion; statistical description and numerical models. (a/y)

552 Fluid Mechanics Science 3 (2-3) Theory and practice in the use of instrumentation for measuring temperature, velocity, pressure and concentration; measurement of classical flow fields. (a/y)

553 Two-Phase Flow V 1-3 May be repeated for credit; cumulative maximum 3 hours. Prereq M E 521. Fundamentals of the flow of fluids with two phases and applications. (a/y)

556 Numerical Modeling in Fluid Mechanics 3 Same as C E 556. (a/y)

561 Combustion V 2-3 Prereq M E 510 or 511. General combustion phenomena, chemical reactions, combustor modeling, laminar and turbulent flame theory, emissions. (a/y)

563 Advanced Heat Transfer 3 Prereq M E 404. Advanced level heat transfer with emphasis on the engineering design aspect of heat transfer.

569 Advanced Topics in Thermal and Fluid Sciences V 1-3 May be repeated for credit. Advanced topics in thermodynamics, heat transfer or fluid mechanics; analytical and experimental methods.
570 Kinematic Synthesis 3 Graduate level counter- 
part of M E 476; additional requirements. 
Credit not granted for both M E 470 and 570.

572 Mechanical Systems Design 3 Graduate level 
counterpart of M E 474; additional re- 
requirements. Credit not granted for both M E 
472 and 572.

574 Advanced Manufacturing Process 3 Graduate 
level counterpart of M E 474; additional re- 
requirements. Credit not granted for both M E 
472 and 574.

575 Manufacturing Automation 3 (3-2) Graduate 
level counterpart of M E 474; additional re- 
requirements. Credit not granted for both M E 
472 and 575.

579 Advanced Topics in Design and Manufacturing 
V 1-3 May be repeated for credit.

581 Control Systems 3 Graduate level counterpart 
of M E 481; additional requirements. Credit 
not granted for both M E 481 and 581.

589 Advanced Topics in Dynamics and Controls 
V 1-3 May be repeated for credit; cumulative 
maximum 9 hours.

598 Seminar 1 May be repeated for credit.

600 Special Projects or Independent Study 
Variable credit.

700 Master's Research, Thesis, and/or Examination 
Variable credit.

702 Master's Special Projects, Directed Study, 
and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Ex- 
amination Variable credit.

Materials Science and Engineering

MSE

110 Metallurgy 2 For freshmen only. Materials 
science and engineering, metallurgy; elements 
of physical metallurgy.

220 Metallurgy 3 (0-0) Prereq major in MSE. 
Principles and techniques of optical 
metallography and other laboratory methods 
used in modern physical metallurgy.

301 Materials Science 3 Prereq Chem 105; Math 
172; Phys 202. Structure of materials, phase 
equilibrium, phase transformations, and 
mechanical properties.

302 Materials Science 3 Prereq Chem 105; Math 
172; Phys 202. Structure of materials, phase 
equilibrium, transformations; electronic 
structure of solids; thermal, electrical, and 
mechanical properties of materials; semiconduc-
tors, dielectrics.

322 Data Acquisition and Laboratory Computing 
2 (1-3) Prereq Cpt S 203 or 150 and 151 or 
153. Computerized data acquisition methods 
and laboratory computing for materials 
science and engineering.

331 Process Metallurgy 3 Prereq Chem 105; Phys 
201 or c/. Mineral preparation, steel making, 
evacuation and refining of selected metals; 
casting, working, machining, welding, powder 
milling, heat treatment of metals.

401 Metallic Materials 3 Prereq MSE 301. 
Physical metallurgy of engineering metals and 
their alloys.

402 Polymeric Materials 3 Prereq MSE 301 or 
junior in eng or Ph S. Structural 
characterization, synthesis, and reactions of 
polymeric materials; relationships between 
structure and properties, viscoelasticity, 
deformation, and physical behavior of 
polymers.

403 Ceramics Materials 3 Prereq MSE 301. 
Processing, characteristics, microstructure, 
and properties of ceramic materials. (a/y)

412 Thermodynamics and Phase Equilibrium 3 
Prereq c/ in MSE 301; Phys 202. Concepts 
of activity, equilibrium, solution properties; 
relationship between free energy, composi-
tion, and temperature; heterogeneous 
equilibria.

413 Mechanics of Solids 3 Prereq C E 314; MSE 
301. Elasticity, elastic stress distributions; 
plastic deformation of single and polycrystals; 
introduction to dislocation theory and its 
applications; creep, fracture, fatigue. (a/y)

414 Equilibrium Diagrams 2 Prereq MSE 301; 
412. Interpretation of equilibrium diagrams; 
tensions, pressures, temperature-relations-
ships. (a/y)

415 Physical Properties 3 Prereq MSE 301. 
Introduction to electron theory and lattice 
vibration theory of solids; applications to thermal, 
electrical, and magnetic properties of solids. 
(a/y)

416 Phase Transformations 3 Prereq MSE 301, 
421, 412. Thermodynamics of solid phase; 
mechanisms and kinetics of diffusion; nuclea-
genesis and growth, recrystallization, 
migration, melting, and martensitic 
transformations.

418 Chemical Properties 3 Prereq MSE 301, 412. 
Thermodynamics and kinetics of heterogeneous 
chemical reactions at reactive 
surfaces; oxidation and other gas-metal 
reactions; corrosion. (a/y)

421 X-ray Diffraction 3 Prereq Phys 202. Properties 
of x-rays, scattering and diffraction; space 
lattices and groups; projections, diffraction 
modes; lattice structure; x-ray spectroscopy.

423 X-ray Diffraction Laboratory 1 (0-3) Prereq 
c/ in MSE 421. X-ray diffraction techniques; 
interpretation of diffraction data from 
metallic and polycrystalline materials.

424 Instrumentation Techniques in Materials 
Science V 2-3 Instrumentation techniques 
used for the study and characterization of 
engineering materials.

425 Physical Metallurgy Laboratory 2 (0-6) 
Prereq c/ in MSE 415. Selected experimental 
work in physical metallurgy.

426 Physical Metallurgy Laboratory 2 (0-6) 
Prereq MSE 425. Selected experimental 
work in physical metallurgy.

450 Seminar 1 May be repeated for credit. For 
seniors only.

499 Special Problems V 1-4 May be repeated for 
credit.

501 Advanced Topics in Materials Science V 2-3 
May be repeated for credit; cumulative 
maximum 6 hours. Chemical crystallography, 
mechanical properties, structure and 
crystallography, non-crystalline solids, 
mechanical structure and 
alloying and fracture mechanisms of 
materials.

503 Advanced Topics in Materials Engineering 
V 1-3 May be repeated for credit; cumulative 
maximum 6 hours.

511 Deformation and Fracture 3 Prereq MSE 301; 
MSE 413 or C E 314. Elementary 
definition theory and its applications to 
important deformation and fracture processes.

514 Thermodynamics of Solids 3 Prereq MSE 414 
or 400-level thermo. Thermodynamic 
properties of solid solutions; models for 
substitutional and interstitial 
solutions; configurational and 
non-configurational contributions; calculation 
of phase diagrams. (a/y)

516 Phase Transformations 3 Prereq MSE 301, 
414, 416. Thermodynamics, nucleation, 
interface motion, mechanisms and kinetics of 
chemical reactions between solid metals and 
their environment. (a/y)

520 Seminar in Materials Science and Engineer-
ing 1 May be repeated for credit; cumulative 
maximum 3 hours. Prerq graduate student in 
MSE. Reporting problems, research and 
research methods in materials science and 
engineering.

533 Fracture in Solids 3 Prereq MSE 413 or C E 
314. Fracture initiation and propagation in 
metals, ceramics, glasses, and other 
materials; effect of environment; relationship 
microstructure.

543 Natural and Synthetic Polymeric Materials 3 
Prereq MSE 402. Glassy, crystalline, and 
rubbery systems of synthetic and natural polymers.

546 Advanced Wood Science 3 Prereq MSE 402; 
Org Chem. Physical, electrical, mechanical, 
and chemical properties of wood. (a/y)

547 Basic Principles of Adhesion 3 Prereq MSE 
402. Principles of interfacial bonding applied 
in the engineering of polymers, wood and 
thermoset systems.

548 Reinforced Polymer and Wood Based Com-
posites 3 Fundamentals of composite 
materials having polymers and wood as main 
components.

549 Nondestructive Testing of Wood-Based 
Materials 3 Principles of nondestructive 
testing applied to wood-based materials.

550 Parameters for Synthesis of Wood Composi-
tion Materials 3 Theory and practice of wood 
composites, materials, manufacture and 
development.

600 Special Projects or Independent Study 
Variable credit.

700 Master's Research, Thesis, and/or Examination 
Variable credit.

702 Master's Special Problems, Directed Study, 
and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Ex-
amination Variable credit.

Schedule of Studies

MECHANICAL ENGINEERING

Freshman Year

First Semester

Hours

Arts and Humanities Elective
3

Com Prof Elective
3

Math 171 Calculus I
4

M E 101 Graphic Design
2

Chem 105 Principles
4

Second Semester

Hours

Econ 102 Fundamentals
3

Cpt S 203 Computer Prog
2

Chem 106 Principles
3

Math 172 Calculus II
4

M E 102 Descriptive Geometry
2

Soc 3 Elective
3

Sophomore Year

First Semester

Hours

Math 273 Calculus III
2

Math 220 Linear Algebra
2

Phys 201 Classical Physics
4

C E 211 Statics
3

E E 214 Logic/Analog Circ.
3

Second Semester

Hours

Math 255 Diff Equations
3

Phys 202 Classical Physics
4

C E 212 Dynamics
3

MSE 301 Materials Science
3

127
Program in Basic Medical Sciences

Junior Year

First Semester
- M E 301 Thermodynamics 3
- C E 314 Mechanics of Mats 3
- M E 320 Materials Lab 1
- M E 310 Mannf Process 1
- M E 311 Process Lab 1
- M E 313 Engineering Analysis 3
- M E 312 Kinematics 3

Second Semester
- M E 302 Thermal Systems 3
- M E 303 Fluid Dynamics 3
- M E 305 Laboratory I 1
- M E 348 Advanced Systems 3
- M E 414 Machine Design 1
- Arts and Humanities Elective 3

Senior Year

First Semester
- E E 304 Elec Circuits 2
- E E 303 Microprocessors 2
- M E 349 Dynamics Lab 1
- Intercultural Studies GUR 3
- Technical Elective 3
- M E Elective 3
- M E 404 Heat Transfer 3

Second Semester
- Engl 402 or Com Prof 3
- M E 416 or 417 Design/Systems 3
- M E 406 Laboratory III 3
- M E Elective 3
- Arts, Hum, Soc S (upper division) 3

MATERIALS SCIENCE AND ENGINEERING

At least 45 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

Freshman Year

First Semester
- Math 171 Calculus I 4
- Chem 105 or 115 4
- M E 110 Metallurgy 2
- Com Prof Elective 2
- Hum or Soc S Elective 2

Second Semester
- Math 172 Calculus II 4
- Math 220 Linear Algebra 2
- Chem 106 or 116 3
- Chem 141 or 117 3
- Hum or Soc S Elective 2
- Com Prof Elective 2

Sophomore Year

First Semester
- Math 273 Calculus III 4
- Phys 201 Classical Phys 2
- M E 331 Process Met 3
- Cpt S 203 Cpt Prog 3
- Econ 112 Fundamentals 3
- Hum Elective 3

Second Semester
- Math 315 Diff Equations 4
- Phys 202 Classical Phys 2
- M E 220 Metallurgy 3
- C E 211 Statics 3
- Intercultural Studies Elective 3

Junior Year

First Semester
- M E 301 Thermodynamics 3
- C E 314 Mech of Mats 3
- M E 301 Materials Science 3

MSE 412 Thermo Phase 3
- MSE 322 Data Acquis 2

Second Semester
- M E 401 Metallie Materials 3
- M E 414 Equil Diagram 2
- M E 418 Chem Properties 3
- M E 421 X-Ray Diffraction 1
- M E 423 X-Ray Diffraction Lab 1
- Technical Elective* 3

Senior Year

First Semester
- M E 402 Polymeric Materials 3
- M E 416 Phase Transform 3
- M E 425 Phys Met Lab 3
- M E 450 Seminar 1
- Hum or Soc S Elective 3

Second Semester
- M E 403 Ceramic Materials 3
- M E 413 Mech Solids 3
- M E 415 Phys Properties 3
- M E 426 Phys Met Lab 3
- M E 451 Seminar 1
- Technical Elective* 3

Courses printed in Roman type are required for graduation; those in italics are optional.

* E E 214, 261, 262, 304, 305, 311, 496; M E 303, 404; C E 315; Ch E 461, 462; QMeth 215; Chem 331, 332, 420, 423; Phys 303, 304, 410; Math 340, 375, 440, 441; Cpt S 215, 310; Stat 430; or other cognate courses.

Certification

Students who have completed at least 30 semester hours of course work and who have completed Engl 101, M E 101, Math 171, Math 172, Chem 105, Phys 201 and C E 211 or their equivalent are eligible to apply for certification into the Mechanical Engineering Department. Applications for certification will be reviewed by a departmental committee. When it becomes necessary to limit enrollment, the overall g.p.a. as well as the g.p.a. for the prerequisite courses listed above, will be important factors. Application deadline dates are March 1 for the fall semester and October 1 for the spring semester. Students who have not completed all of the prerequisite courses will be placed in a pre-engineering major and assigned to a mechanical engineering advisor. Additional details and application forms are available from the department student services office.

Students who have completed 30 semester hours of course work and who have completed Math 171, Math 172, Chem 105 and Chem 106 are eligible for certification into the Materials Science and Engineering program. All courses must be completed before applying. Other criteria considered for certification are overall g.p.a. and performance in other mathematics, science and engineering courses. Additional details and application forms are available from the department student services office.

Transfer Students

The Department of Mechanical and Materials Engineering cooperates with the community colleges in Washington to minimize problems associated with transfer. Inquiry are welcome. A strong preparation in mathematics, physics, and chemistry is necessary prior to transfer to minimize the time required at Washington State University to complete the bachelor's degree requirements.

The requirements for direct entry into the mechanical engineering or materials science and engineering programs upon transfer are the same as listed above for certification. Transfer student applications will be handled by the Admissions Office and sent to the department so that students do not need to make separate application to the department.

Preparation for Graduate Study

Before undertaking graduate study, a student should have completed substantially the equivalent of the first two years of study. Students from other scientific disciplines (such as physics, chemistry, mathematics) are encouraged to apply. Specific details concerning prerequisites for such students are worked out on an individual basis.

Program in Basic Medical Sciences


The Program in Basic Medical Sciences is an integral part of the Washington-Alaska-Montana-Idaho(WAMI) Program in the Extension of Medical Education, and course work is parallel with and equivalent to the first year curriculum of the University of Washington School of Medicine. The entire program is taught in concert with the University of Idaho. With few exceptions, courses are taught on both campuses with faculty from WSU and Idaho taking part in each. WAMI students being taught as a single class. All WAMI students are members of the first year class of the University of Washington School of Medicine and all courses may apply to the M.D. degree granted by that university.

Because of specialized support material required and the nature of course content, course enrollment is restricted. With the approval of the program chair and the student's adviser, certain of the courses listed below may be used in graduate programs leading to advanced degrees granted by other academic units.

In accordance with School of Medicine policy, all Med S courses are S, F graded.

Description of Courses

For explanation see Index under "Symbols"

Med S
- 501 Medical Preceptorship 1 May be repeated for credit; cumulative maximum 2 hours. For WAMI students only. Practicum, observations of medical practice in Whitman County with individual physician volunteers.
510 Histology 3 (2-3) Description and microscopic examination of cell types, tissues, and major organs of the human body.

511 Anatomy of the Trunk 5 (4-3) For WAMI students only. Extensive regional study of human thorax, abdomen, pelvis, and perineum; embryology and living anatomy; correlates gross with clinical anatomy.

512 Basic Mechanisms in Cellular Physiology 4 Basic physiological mechanisms, primarily at the cellular level.

513 Introduction to Clinical Medicine I 1 For WAMI students only. Instruction in communications skills and interview techniques to form the basis for the eventual doctor-patient relationship.

514 Molecular and Cellular Biology I 3 Classical molecular and cellular biochemistry, cellular physiology and molecular genetics.

515 The Ages of Man 2 Physical and psychological development of the whole individual from birth through old age.

520 Cell and Tissue Response to Injury 5 (4-3) Patterns of cell and tissue response to injury; immunity and immune response; neoplasia.

521 Natural History of Infectious Disease and Chemotherapy 5 (4-3) Pathogenesis and immunity of infectious diseases, clinical manifestations and control of representative bacterial, fungal, parasitic, and viral infectious diseases.

522 Introduction to Clinical Medicine II 2 For WAMI students only. Communication skills as related to and dealing with affective material.

524 Molecular and Cellular Biology II 2 Continuation of Med 5 S14.

530 Epidemiology 2 Basic principles of epidemiologic processes; statistical inference from clinical data.

531 Head, Neck, Ear, Nose and Throat 5 (4-3) For WAMI students only. Gross anatomy, including skull, pharynx, and larynx; audition and balance.

532 Nervous System 2 (4-3) Normal structure and function of the nervous system, including the eye.

533 (523) System of Human Behavior 2 Interactive nature of biomedical, psychological, and social factors influencing illness; applying psychological principles in the medical setting.

535 Introduction to Clinical Medicine III 2 (1-2) For WAMI students only. The screening physical examination.

600 Special Projects or Independent Study V 1-6 May be repeated for credit; cumulative maximum 6 hours.

### Department of Microbiology

Professor and Department Head, H. M. Nakata; Professors, L. P. Mallia, W. R. Rayburn, K. D. Spencer; Associate Professors, K. P. Bertrand, R. E. Hurbert, M. L. Kahn, N. S. Magnuson, K. L. McVor, J. L. Pazzonka, K. Postle.

Microbiology is both a basic and an applied science. At the undergraduate level, the Department of Microbiology offers options in microbiology and medical technology, leading to a Bachelor of Science degree in Microbiology. Majors are required to develop a strong background in the basic sciences before taking courses in microbiology and those required by the various options. Employment opportunities in industrial, government, hospital and private laboratories and agencies are excellent for qualified graduates. A year-long hospital internship in an accredited school of medical technology is required after graduation for those interested in becoming certified medical technologists. Course opportunities in this area are also excellent. Majors may also prepare for advanced degrees and easily complete the requirements for application to medical, dental, veterinary or other professional schools.

At the graduate level, the department offers programs leading to the degrees of Master of Science in Microbiology and Doctor of Philosophy. Areas in which the department is prepared to direct research include the biology of membranes, molecular genetics, molecular basis of cell-cell interactions and virulence, microbial differentiation, cellular and tumor immunology and the regulation of the immune response, diseases of insects and their development of resistance to microbial pathogens, environmental microbiology and ecology.

### Description of Courses

For explanation see index under "Symbols"

**Micro**

101 [B] Elementary Bacteriology and Public Health 4 (3-3) Students who receive a B grade in this course may substitute it for Micro 201 as a prereq for advanced courses. Biolo of bacteria with special reference to man. Credit not granted for both Micro 101 and 201.

201 General Microbiology 5 (3-6) Prereq 1 yr college chem; 1 sem college biology. The classification, physiology, and techniques for cultivation of microorganisms, especially bacteria; applications to agriculture, medicine, and industry.

310 Medical Bacteriology 3 Prereq Micro 201; Chem 240. The bacterial pathogens and their relationship to disease.

311 Diagnostic Medical Bacteriology 2 (0-6) Prereq Micro 310 or c/. Techniques and tests for the identification of bacteria pathogenic for man.

350 Clinical Laboratory Procedures 4 (2-6) Prereq Micro 201; Organ Chem. Techniques, interpretation, and theory of urinalysis, clinical chemistry, and hematology.

408 Medical Microbiology 1 Prereq Micro 310. The microbiology of fungi that cause infections in man. (a/s)

410 Advanced Medical Microbiology and Mycology 3 Prereq Micro 310. Analysis of bacterial virulence determinants; fungal infections of man. (a/s)

412 Immunology 4 (2-0) Prereq Micro 310; Organ Chem. Principles.

414 General Virology 3 Prereq GenCB 301; Organ Chem. The biology of bacterial, animal, and plant viruses. Credit not granted for both Micro 414 and 514.

415 General Virology Laboratory 2 (0-6) Prereq Micro 414 or c/. Laboratory techniques concerning cultivation and characterization of viruses.

416 Microbiology of Foods 3 (3-3) Prereq Micro 201; Organ and Quant Chem. Microorganisms important in food; reference to spoilage processes and their control.

420 Epidemiology 3 Prereq Micro 310. Epidemiological concepts; theoretical and quantitative aspects of distribution, dynamics, and determinants of disease in human populations.

428 Basic and Applied Microbial Physiology 3 Prereq Micro 201; BC/BCP 364. Basic microbial physiology and its relevance to the processes of applied microbiology. Credit not granted for both Micro 428 and 528.

462 Microbial Genetics 3 Prereq Micro 201, GenCB 301, or BC/BCP 364. Genetics of bacteria, bacteriophages and plasmids; regulation of gene expression; genetic manipulation of microorganisms.

464 Techniques in Molecular Biology 3 (1-6) Prereq Micro 201, GenCB 301, or BC/BCP 364, 366. Introduction to basic principles and techniques of gene manipulation.

495 Internship in Microbiology V 1-4 May be repeated for credit; cumulative maximum 8 hours. Prereq Micro 201, 310, 311. Experience in work related to specific career interests.

499 Special Problems V 1-4 May be repeated for credit.

512 Immunology 3 The immune system at the animal, cellular, and molecular levels.

513 Research Techniques in Immunology/ Biologie 2 (0-6) Prereq 1 yr in Micro 512 or immunology course.

514 General Virology 3 Graduate level counterpart of Micro 414; additional requirements. Credit not granted for both Micro 414 and 514.

528 Basic and Applied Microbial Physiology 3 Graduate level counterpart of Micro 428; additional requirements. Credit not granted for both Micro 428 and 528.

529 Research Techniques in Microbiology 3 (1-6) By interview only. Modern biochemical and physiological techniques for research studies in microbiology.

541 Seminar 1 May be repeated for credit. Literature reviews and research reports.

556 Physiology 4 (3-3) Same as Bot 556.

560 Molecular Genetics 3 Same as GenCB 560.

570 Advanced Immunology 3 Prereq introductory course in immunology. Cellular and molecular regulation of the immune response. (a/s)

580 Selected Topics in Microbiology 1 May be repeated for credit; cumulative maximum 2 hours. Prereq 9 hrs upper-division Micro.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

### Schedule of Studies

At least 40 of the total hours required for the bachelor's degree in this department must be in upper-division courses. For majors, a total of 28 credit hours must be in the departmental courses and a minimum p.p.a. of 2.0 is required in these courses for graduation. The core requirements for the freshman and sophomore years are the same for microbiology and medical technology options. No more than 8 of the core courses or departmental courses may be taken pass-fail.

#### Core Requirements

Bio 510, 103, 104; Chem 105, 106 and 107, 220 and 222, 240; Math 107 and 108; Phys 101, 102; BC/BCP 364, 366.
Microbiology Option
Micro 310, 311, 412, 414, 415, 9 additional hours Micro; GenCB 301, and one advanced lecture-lab course outside the department are required as a minimum. Those contemplating graduate study are urged to take Chem 340-343 series in lieu of Chem 240, and Math 171, 172.

Medical Technology
Same as Micro option except that Micro 350 and Zoool 417 are required. Micro 350 partially fulfills requirement for 9 credits of Micro electives and Zoool 417, the requirement for one advanced lecture-lab course outside the department. Micro 410 and Zoool 251 are strongly recommended.

Minor in Microbiology
A minimum of 16 semester hours including Micro 101 or 201 and the remaining at the upper-division level selected from: Micro 310, 311, 350, 408, 412, 414, 415, 416, 420, 428, 462, 464, 499.

Transfer Students
Students transferring from other institutions as juniors should have taken the equivalent of Micro 201; Chem 105, 106, 107, 220 and 222 or 240 (preferably both); Engl 101; Bio S 103, 104; one year of one modern foreign language in college or two years in high school; and part of the required 21 hours in social sciences and humanities. The other required courses normally taken in the first two years may be taken in the upper-division program.

Preparation for Graduate Study
For admission to graduate study in microbiology a student should have a bachelor's or master's degree and should present evidence of proficiency in academic work. Normally the applicant should have an undergraduate major in microbiology, biological science, molecular biology, or chemistry; however, candidates with a good record in related fields may be well prepared for certain areas of advanced study in microbiology.

Department of Military Science

Professor and Department Head, Lieutenant Colonel D. Johnson; Assistant Professors, Majors K. Kayler, D. Mount; Captains M. Raxter, W. McLoughlin, W. Appleby, K. Chenault; Staff Affiliates, SG M. Cleaver, MSG S. Ellingsen, SSG S. Gardner, SSG A. Tugman.

The Department of Military Science at WSU is designed to supplement a student's academic studies by motivating, educating, and training qualified students to serve as commissioned officers in all components of the Army (Active Army, Army National Guard, Army Reserve). The military science, intellectual, professional and technical education and training complement the educational programs at WSU. Students interested in a minor in military science should contact the department for a list of requirements.

The military science curriculum normally comprises a 2-year Basic Course (freshman and sophomore years), and a 2-year Advanced Course (junior and senior years). The Basic Course is open to all men and women students at WSU. Students with special prerequisites (previous military service, Junior ROTC, Basic Camp and others) may receive credit for all or part of the Basic Course. With this credit, they may enter as Military Science majors (MS III) and thus complete the Army ROTC Program in two academic years. Enrollment into the Advanced Course must be with the approval of the Department Head. During the summer between the junior and senior years of Military Science, the cadets attend ROTC Advanced Camp (6 weeks at Fort Lewis, WA). It is a training/evaluation/field leadership opportunity. The camp is operated by experienced ROTC faculty from across the country and includes cadets from 24 states.

At WSU, military science courses are academic in nature. The practical aspects of military education and training are taught in leadership labs and summer camps. Advanced Course students are required to participate in leadership labs which are conducted throughout the year. These events provide instruction in individual military skills and group leadership techniques. Practical leadership experience is also gained through these experiences since they are organized and conducted by the cadets under the supervision of the cadre.

Advanced Course students receive a monthly stipend of $100 per month during the school year. Additionally, if these students are members of the Army National Guard or Army Reserve, they receive $140 per month G. I. Bill money and $10 per month from their respective reserve unit. Competitively awarded scholarships are available which, in addition to the stipend, pay full tuition, enrollment fees and the costs of necessary equipment and supplies. High school students may apply for a 4-year ROTC scholarship in the fall of their senior year; all students may apply for two or three year scholarships even if they are not enrolled in the ROTC Program.

Upon successful completion of the Advanced Course and graduation from WSU, the cadets are normally commissioned into the U.S. Army Reserve. Students may also compete for active duty and commissions in the Regular Army. Those who wish to seek advanced degrees may apply for a delay to active duty in order to complete their studies before entering active service.

Description of Courses
For explanation see Index under "Symbols"

Basic Course

201 Basic Summer Camp 6 Prereq. 2 yrs college. By interview only. Intensive orientation and internship in military training and skills held at an active Army post. Successful completion qualifies for Advanced ROTC. (SS)

202 Military Science Overview 5 Preparation for advanced military science program; map reading, tactics, leadership, U. S. military history, fundamentals of army duty. (SS)

Advanced Course

301 Advanced Leadership and Management 3 Prereq. Leadership courses emphasizing instruction in military professionalism and ethics; practical aspects of tactics and leadership practices.

302 Small Unit Tactics and Military Leadership 3 Preparation, delivery, and critique of practical oral presentations; leadership of small units; offensive, defensive and retrograde operations.

306 Advanced Summer Camp 6 Prereq. MIL S 301, 302. By interview only. Intensive study and internship in military tactics, command and leadership; held at Fort Lewis, WA. (SS)

385 History of Modern Warfare 3 Same as Hist 385.

401 Advanced Military Leadership 3 Historical and legal basis of military justice; small unit management; military professionalism and ethics.

402 Advanced Military Management and Practice 3 Theory and practice of Army administration/management; staff planning and correspondence; pre-commission orientation; unit management/resources application.

409 Special Problems V 1-4 May be repeated for credit.

Department of Music


The Music Department is committed to a tradition of excellence in performance, teaching, and the study of theoretical, historical, and philosophical aspects of the musical arts. Its chief objectives are:

- to provide students with a foundation in the analysis and criticism of music and guide them toward acquiring discriminating judgment in a progressive musical environment;
- to train teachers of music who can be effective in contemporary society;
- to assist the aspiring performer and composer to reach the highest potential of artistic capacity;
- to contribute toward a varied humanistic education within the university community.

As an integral part of the academic program, the department maintains a vital offering of recitals and concerts by students, faculty, and guest artists.

The department offers courses of study leading to the degrees of Bachelor of Music, Bachelor of Arts in Music, and Master of Arts in Music. The Department of Music is a full member of the National Association of Schools of Music.
Description of Courses

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 either performance studies or 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) or study in a secondary performance medium by music majors.

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 200-300-400-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. Students enrolled in 300-400-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 all of these criteria are met. In addition, each music major must pass the piano proficiency exam, as a pre-requisite to upper-division standing. Performance studies may not be taken on a pass-fail basis. Description of each course listed below may be obtained from the Department of Music office.

Non-Major and Secondary Performance Studies

100-200 level available for 2 credits only.

Class Instruction

Mus 102 Piano
103 Voice
120 Guitar

Studio Instruction

Mus 201 Organ
202 Piano
203 Voice
204 Horn
205 Trumpet
206 Trombone
207 Baritone
208 Tuba
209 Percussion
210 Violin
211 Viola
212 Violoncello
213 Contrabass
214 Flute
215 Oboe
216 Clarinet
217 Bassoon
218 Saxophone
220 Guitar

Major Performance Studies

Admission to the 300 level is by examination only. Students normally progress from the 300 level to the 400 level by upper-division standing examination before a representative committee of the faculty. This evaluation will include all aspects of the student’s program, including performance, literature, and core music requirements. The 500 level represents credit for graduate study and is limited to enrolled graduate students pursuing a master’s degree. Credit for the 300, 400 and 500 levels is granted on the basis of two credits for one-half-hour lesson per week and four credits for two-half-hour lessons per week.

Mus 301, 401, 501 Organ
302, 402, 502 Piano
303, 403, 503 Voice
304, 404, 504 French Horn
305, 405, 505 Trumpet
306, 406, 506 Trombone
307, 407, 507 Baritone
308, 408, 508 Tuba
309, 409, 509 Percussion
310, 410, 510 Violin
311, 411, 511 Viola
312, 412, 512 Violoncello
313, 413, 513 Contrabass
314, 414, 514 Flute
315, 415, 515 Oboe
316, 416, 516 Clarinet
317, 417, 517 Bassoon
318, 418, 518 Saxophone
320, 420, 520 Guitar

159 Secondary Performance Study 1 or 2 May be repeated for credit; cumulative maximum 6 hours. Prequel bachelor's degree in music. Instruction on instruments or voice other than major performing medium.

Music Performing Groups

Mus 428 Opera Workshop 1 Four rehearsal hours a week. May be repeated for credit; cumulative maximum 8 hours. Open to students by audition. Public performance may be required.
429 Crimson Company Quartet 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. By audition only. SATB. All styles of popular music; public performance required.
430 Crimson Company Show Choir 2 (0-4) May be repeated for credit; cumulative maximum 16 hours. By audition only. Popular music performances with choreography. Public performances required.
431 Choir 1 Four rehearsal hours a week. May be repeated for credit; cumulative maximum 8 hours. Open to students by audition. Public performances each semester.
432 University Singers 1 Four rehearsal hours a week. May be repeated for credit; cumulative maximum 8 hours. Open to students by audition. Public performance may be required.
433 Vocal Ensembles 1 Four rehearsal hours a week. May be repeated for credit; cumulative maximum 8 hours. Open to students by audition. Public performance may be required.
434 Symphony Orchestra 1 Four rehearsal hours a week. May be repeated for credit; cumulative maximum 8 hours. Open to students by audition. Orchestral literature and public performance each semester.
435 Chamber Ensembles 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. Open to students by audition. Public performance may be required.
436 Symphonic Band 1 (0-4) May be repeated for credit; cumulative maximum 8 hours. Open to students by audition. Public performance.

437 Wind Symphony 1 Four rehearsal hours a week. May be repeated for credit; cumulative maximum 8 hours. Open to students by audition. Public performances.
438 Jazz Lab Band 1 Four rehearsal hours a week. May be repeated for credit; cumulative maximum 8 hours. Open to students by audition. Public performances.
441 Accompanying 1 May be repeated for credit; cumulative maximum 8 hours.
444 Marching Band/Varsity Band 1 May be repeated for credit; cumulative maximum 8 hours. Open to all university students by audition.

Theory

Mus 152 Music Fundamentals 2 (1-3) Notation of pitch, rhythm, scales, intervals, triads, fundamental harmonic progression, coordinated with singing.
251 Materials and Structures of Music 3 By examination. Orchestral, melody, rhythm, intervals, tonality, melody, penza-styles, two-voiced counterpoint, analytical techniques, composition.
252 Applied Theory 1 (0-3) By examination. Ear training, conducting, rhythmic reading, sight singing, keyboard, dictation.
253 Materials and Structures of Music 3 Prequel Mus 251, 252. Writing, analysis of three and four voice homophonic and contrapuntal music, diatomic emphasis, seventh chords, modulation.
254 Applied Theory 1 (0-3) Prequel Mus 252; c in Mus 253. Ear training, sight singing, keyboard.
257 (237) Jazz Improvisation 1 May be repeated for credit; cumulative maximum 3 hours. Melodic jazz improvisation.
351 Materials and Structures of Music 3 Prequel Mus 252, 254. Vertical, linear and formal relationships of harmonic music; writing, analysis, coordinated with aural study.
352 Applied Theory 1 (0-3) Prequel Mus 254. Continued musical development in ear training, sight singing, applied theory, keyboard dictation.
353 Materials and Structures of Music 3 Prequel Mus 351. Vertical, linear and formal relationships of 20th century music; writing, analysis, listening.
354 Applied Theory 1 (0-3) Prequel Mus 352. Continued development in ear training, sight singing, keyboard, dictation, emphasizing 20th century music.
355 Seminar in Jazz Arranging/Composition 2 Arranging and composing for instrumental jazz ensembles.
356 Seminar in Counterpoint 2 May be repeated for credit; cumulative maximum 4 hours. Prequel Mus 353. Contrapuntal techniques of the 16th and 18th century with original stylistic writing.
453 Form and Analysis 2 Prequel Mus 353. Organization of musical works according to the relationships in sectional divisions, thematic divisions, and tonal bases.
455 Seminar in Instrumentation 2 May be repeated for credit. Prequel Mus 352. Scoring for various instrumental combinations.
456 Seminar in Composition V 1-3 May be repeated for credit. Prequel Mus 353. Original writing in small, large forms; traditional, experimental.
Prereq Mus 360, 361, 460. Various historic periods and composers.

Music Education

Mus

181 Class Piano I 1 (0-3) May be repeated for credit; cumulative maximum 2 hours. For majors, minors, and Elem Educ majors only. Pedal, sightreading, transposition, playing by ear, chord progressions and melody harmonization. Open to students by audition.

182 Class Piano II 1 (0-3) May be repeated for credit; cumulative maximum 2 hours. Continuation of Mus 181. Scales, arpeggios, blocked and broken chords; repertoire to complement individual skills and theoretical knowledge. Open to students by audition.

281 Class Piano III 1 (0-3) May be repeated for credit; cumulative maximum 2 hours. Prereq Mus 182. Principles, functional keyboard. Open to students by audition.

371 Diction for Singers I 2 Prereq Mus 303. Italian and German; International Phonetic Alphabet; fundamental diction principles, applied to each language and oriented to needs of the singer.

372 Diction for Singers II 2 Prereq Mus 303. French and English; International Phonetic Alphabet, fundamental diction principles, applied to each language and oriented to needs of the singer.

382 Fundamental String Techniques I (0-3) Majors and minors only. Beginning class in strings.

Music for the Classroom Teacher 2 For elementary education majors. Movement, singing, listening and instrumental resources appropriate for use in the elementary grades.

389 Choral Programs 2 For majors, minors, and Elem Educ majors only. Choral organizations, auditions, placement, intonation, balance, blend, diction, phrasing, styles, and materials.

390 Instruments for Elementary Education 2 or 3 Prereq El/Se 300. Skill building and teaching methods in percussion, melody and harmony instruments for use in the elementary grades.

393 Wind and Percussion Techniques I 2 (0-6) Prereq Mus 152. Brass, woodwind and percussion techniques; elementary instrumental conducting.

394 Wind and Percussion Techniques II (0-6) Prereq Mus 152. Brass, woodwind and percussion techniques; elementary instrumental conducting.

480 Music Education 3 Philosophies, administration, organization, materials, and methods.

481 Elements of Conducting I (0-3) Prereq Mus 251. Patterns and styles of conducting, score reading.

482 Instrumental Conducting 1 (0-3) Score reading, clefs, transposition, aural training, rehearsal techniques, ensemble seating, and programming.

483 Seminar in Ensemble Conducting 1 (0-3) Prereq Mus 482. Practical laboratory experience directing musical groups in rehearsal.

485 Seminar in Vocal Pedagogy 2 Prereq performance studies in voice. Vocal mechanism, teaching procedures, and materials.


487 Seminar in String Pedagogy 2 Teaching of the strings; materials and methods.

490 Materials and Methods for Music Teachers 2 or 3 Current programs and trends in the teaching of music on the elementary level; Dalcroze, Kodaly, Orff, Manhasset and, ETTM.

575 Advanced Conducting 2 or 3 May be repeated for credit. Prereq Mus 482. Rehearsing orchestras, bands, and choruses. Public performance may be required.

Problems, Research, Recitals, and Thesis

Mus

499 Special Problems V-1-4 May be repeated for credit.

552 Graduate Recital 2 Private screening and public performance as required within each performance emphasis.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

Schedule of Studies

In addition to the requirements listed under the various options for the Bachelor of Music degree and the Bachelor of Arts degree in Music, each student must satisfactorily complete a theory-history core consisting of: Mus 161, 251, 252, 253, 254, 351, 352, 353, 354, 360, 361 with a minimum 2.00 g.p.a. Each student is required to pass the piano proficiency exam. Students must also complete the General University Requirements plus those for the College of Sciences and Arts.

BACHELOR OF MUSIC

This four-year program offers options for specialization in performance, composition and theory, and music education. At least 42 of the 128 hours required for this degree must be upper-division courses.

The following curricula are designed to prepare students as professional musicians and teachers of music.

Students following option I, II, or III are required to present an acceptable junior and senior recital in the major performance medium.

Option I. Keyboard --- 89 hours

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<tr>
<th>Hours</th>
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<tr>
<td>25</td>
<td>Theory-History Core</td>
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<td>32</td>
<td>Performance Studies</td>
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<td>2</td>
<td>Secondary Instrument</td>
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<td>2</td>
<td>Mus 451 Counterpoint</td>
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<td>2</td>
<td>Mus 453 Form and Analysis</td>
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<td>Mus 465 Sem Major Perf Lit</td>
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<td>1</td>
<td>Mus 481 Conducting</td>
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<td>1</td>
<td>Mus 486 Piano Pedagogy</td>
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<tr>
<td>6</td>
<td>Music Performance Groups (to include 1 hour of Mus 435 and 1 hour of Mus 441)</td>
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<tr>
<td>16</td>
<td>Electives, 10 minimum in Music</td>
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All keyboard majors are required to accompany an approved junior or senior recital.

Option II -- Brass, Woodwinds, Strings, Percussion --- 89 hours

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<th>Hours</th>
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<td>25</td>
<td>Theory-History Core</td>
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<td>32</td>
<td>Performance Studies</td>
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<td>2</td>
<td>Secondary Performance Studies</td>
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<td>2</td>
<td>Mus 453 Form and Analysis</td>
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<td>2</td>
<td>Mus 455 Sem in Instrumentation</td>
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</table>
Music Theory-History Option—81 hours

Music Theory-History Core
- Theory-History Core 25 Hours
  - Credit Theory-History Core
  - Mus 451 Counterpoint
  - Mus 464 Colloquium
  - Performance Studies
    - When the student's major performance area is not keyboard, at least 2 hours of study in piano or organ is required.
- Muse Performance Groups 4 Hours
- Electives 12 minimum in Music

Vocal or Instrumental Performance Option—81 hours

Vocal or Instrumental Performance Studies
- If the student's major performance area is neither piano nor organ, at least 4 hours of Music 202 or 302 are required.

Master of Arts in Music

Please consult the current WSU Graduate Study Bulletin for further information.

Music Minor

A 22 credit music minor course of study is available. For details contact the Music Department.

Program in Native American Studies

Professor, W. Willard; Assistant Professor, J. Peterson.

The program offers a minor in Native American Studies which requires a minimum of 16 hours of credit, half of which must be in upper-division course work.

BACHELOR OF ARTS IN MUSIC

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 hours required for a degree in this program, a minimum of 48 credits in music is required, 40 of which must be in upper-division courses. The music concentration may be in either theory, history or performance.

Naval Science

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 Navy or Marine Corps and active duty in the Navy or 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. A student must have at least 12 credit hours of college work before entering the program.

Scholarship Program

The scholarship benefits include tuition, fees, books, and a $100 per month stipend.

Naval Science

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 Navy or Marine Corps and active duty in the Navy or 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. A student must have at least 12 credit hours of college work before entering the program.

Scholarship Program

The scholarship benefits include tuition, fees, books, and a $100 per month stipend.

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 performance.

A student on scholarship participates in three summer training cruises of four to six weeks duration. The first and third cruises are aboard ships of the Pacific or Atlantic fleets and often include travel to Europe or the Far East. During the second cruise, students are introduced to the submarine, amphibious warfare (Marine Week), surface warfare, and aviation communities.

During summer cruises, the students receive one-half the pay of an ensign, in addition to room and board. Graduates of this program are commissioned as regular officers in the Navy or Marine Corps.

College Program

Application for this program is made directly to the head of the Department of Naval Science. Students receive their uniforms and Naval Science textbooks at no cost and begin receiving a monthly stipend of $100 per month at the beginning of their junior year. College Program students may be nominated by the Professor of Naval Science for
INTERCOLLEGIATE PROGRAM IN NURSING

The lower-division courses, freshman and sophomore years, are offered on the Pullman campus. They provide the student with a foundation in the natural and social sciences and the humanities.

The upper-division courses, junior and senior years, are offered at the Intercollegiate Center for Nursing Education in Spokane, and in Yakima. They provide the professional preparation in nursing. To apply for admission to the center, 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 program of study leads to the degree of Bachelor of Science in Nursing. It is approved by the Washington State Board of Nursing and accredited by the National League for Nursing. Upon successful completion of the baccalaureate program, students are eligible to take the state examination for licensure as Registered Nurses.

TRANSFER STUDENTS

Students who plan to transfer to nursing at Washington State University from other institutions should discuss their program early with the nursing adviser on the Pullman campus to select courses that will be applicable to the degree requirements.

Registered nurses who plan to obtain their baccalaureate degree in nursing from Washington State University may obtain admission and curricular information from the nursing adviser on the Pullman campus. Upper-division nursing major requirements and policies pertinent to the registered nurse should be discussed with the nursing adviser at the center in Spokane.

MASTER OF NURSING PROGRAM

The Graduate Program in Nursing at the Intercollegiate Center for Nursing Education was established in 1983 and accredited by the National League for Nursing in 1986. The program builds upon an undergraduate baccalaureate degree in nursing and provides a basis for further study at the doctoral level. The purpose is to prepare students for leadership positions. Three options are available: Nursing Service Administration, Nursing Education and Advanced Nursing Practice: Adult Acute Care.

The Master of Nursing program is open to students who hold a Bachelor of Science in Nursing degree from a National League for Nursing accredited program. Admission is granted on the basis of the student's (1) undergraduate g.p.a., (2) performance on the Graduate Record Examination, (3) skills in history taking and physical assessment, (4) completion of a course in basic descriptive and inferential statistics, (5) eligibility for licensure as a registered nurse in Washington state, and (6) recommendations relative to professional nursing competence and prediction of success as a graduate student.

Students entering Washington State University apply to the Graduate School Office in Pullman and the Graduate Program Office at the ICNE. Program information, determination of student interests and goals, and assignment of a faculty adviser are provided by the Graduate Program Office at the ICNE.

SCHOOL NURSE CERTIFICATION PROGRAM

The Eastern Washington School Nurse Certification Program is implemented through the ICNE. The program unit, which consists of representatives from the ICNE, Eastern Washington
University, Washington State University, Whitworth College, School Nurses of Washington Association, Washington State Nurses Association, Washington Education Association, and Education School District 101, designed the school nurse program and is the policy-making body for this program.

This program was reaccredited under new guidelines by the Washington State Department of Education in November 1985. The Director of Continuing Education advises and directs the academic programs of study that lead to certification by the Superintendent of Public Instruction. Two levels of School Nurse Certification are available: (1) Educational Staff Associate—Initial Level; and (2) Educational Staff Associate—Continuing Level. Applicants for the program must have a Bachelor of Science in Nursing degree.

Description of Courses

For explanation see Index under "Symbols"

The following courses are offered at the Intercollegiate Center for Nursing Education—Spokane Campus.

**Nurs**

**200** Profession of Nursing 2 Theoretical/historical aspects of professional nursing; development of nursing roles, scopes of practice, problem solving, and ethical decision making.

**307** Assertiveness Training for Nurses 2 Preq 2 Preq junior map. Assertiveness training to assist professional nurses in improving interpersonal relationships in nursing situations.

**310** Pharmacological Basis of Nursing Practice I 2 Preq junior in Nurs or by interview. Major drug classes, pharmacokinetics, mechanisms of drug action, toxic effects; nursing implications including age, minure, patient education.

**312** Pathophysiological Basis of Nursing Practice 3 Preq junior in Nurs or by interview. Pathophysiological processes, interrelatedness with physiological defense mechanisms, theories of stress, adaptation, age and psychological/behavioral responses.

**313** Mental Health Concepts: Individual and Family 2 Preq junior in Nurs or by interview. Mental health in individuals/families: anxiety, stress and adaptation; assertiveness, family theory and dynamics; nuclear roles/nursing process with families.

**320** Nursing Concepts: Foundations 3 Preq Nurs 310, 312, 330 or c/; junior in Nurs. Nursing concepts foundational to care of well/fill clients; nursing process, nurse/client roles, communication, relationship, basic needs and teaching-learning process.

**321** Nursing Practice: Foundations 4 (0-12) Preq junior in Nurs; Nurs 320 or c/. Clinical application of the nursing process; psychomotor skills and interpersonal relationships in the care of adult clients.

**330** Nursing Concepts and Practice: Health Assessment 3 (2-3) Preq Junior in Nurs. Holistic multi-dimensional assessment of the well client throughout the adult years; comparison of findings with established norms.

**340** Nursing Concepts: Parent-Child 5 Preq Nurs 320 or 331 or c/. Theoretical concepts underlying holistic nursing care for families during childbearing and childrearing.

**499** Special Problems V 1-4 May be repeated for credit.

**501** Nursing Theory and Research I 3 Preq graduate student in Nursing. Theory development in nursing; research methods in nursing; literature review, problem identification, conceptual framework design, and sampling.

**502** Nursing Theory and Research II 3 Preq Nurs 501. Data collection and data analysis, interpretation of findings, presentation of results; relationship between research and nursing practice.

**503** Theory Development and Evaluation V 2-4 Preq graduate student in Nursing. Theories and conceptual models in nursing; identification and application of strategies for deriving testable hypotheses.

**507** Professional Issues 2 Preq graduate student in Nursing. Key issues affecting health care and the nursing profession; societal trends and issues and the implications of nursing.

**508** Strategies for Nursing Leadership 2 Strategies which form the core of nursing leadership regardless of role, position, or setting.

**513** Nursing Service Administration: Theory and Role Analysis 4 Preq graduate student in Nursing. Key issues affecting nursing administration; nursing and management theories for application in nursing service settings.

**514** Personnel Management in Nursing 3 Preq graduate student in Nursing. Theory and concepts related to human behavior in the workplace; staffing, recruitment, hiring, retention, performance appraisal, labor-management relations.

**516** Practicum in Nursing Administration 5 (1-12) Preq Nurs 508, 513, 540, 574. Management theories, concepts, processes in field experiences; leadership behavior/validations of the role of nurse manager.

**521** Process of Teaching, Learning and Evaluation in Nursing Education 3 Preq graduate student in Nursing. Critical analysis of concepts related to teaching-learning, assessment of learning needs, instructional strategies, learning objectives, evaluation of performance, measurement.

**523** Nursing Education: Theory and Role Analysis 4 Preq graduate student in Nursing. Key issues affecting nursing education; application of educational theories in a variety of nursing education settings; critical analysis of concepts.

**524** Multimedia Approaches to Instruction and Evaluation V 2-4 Preq Nurs 521. Group and individualized instruction and evaluation; creating instructional software, use of TV studio, AV, and computers.

**526** Practicum in Nursing Education 5 (1-12) Preq Nurs 508, 521, 523, 574. Seminar and individualized field experience in classroom and clinical settings; application of educational theories and processes relevant to nurse educators.

**533** Acute Care Nursing: Concepts and Role Analysis 4 Preq Nurs 571. Concepts essential to acute care nursing; implications for clients, families, society, and health care delivery systems.

**536** Practicum in Acute Care Nursing of Adults 5 Preq Nurs 533, 574, 581. Individualized field experience and seminar designed to provide advanced competency in adult acute care nursing; diagnosis and treatment.

**541** Advanced Psychiatric/Mental Health Nursing 3 Psychopathology and appropriate
nursing interventions with individuals across the age continuum, families, groups, and communities.

543 Psychiatric/Mental Health Nursing: Concepts and Role Analysis 4 Selected therapeutic approaches and issues in psychiatric/mental health nursing; interdisciplinary relationships.

546 Practice in Psychiatric/Mental Health Nursing 5 (1-12) Prereq Nurs 541, 543, 574. Field experience/sem inar with focus on assessment, diagnosis, treatment of clients, families, groups, communities; mental health concepts/approaches.

561 Advanced Concepts in Transcultural Nursing 3 Prereq graduate student in Nursing. Transcultural nursing and ethnonsursing; sociocultural and biocultural theories of health and illness; applicability to nursing and health care.

571 Advanced Nursing Concepts I 3 Prereq graduate student in Nursing. Nursing's distinctive domain in the health care system; conceptualization of client's diagnostic reasoning process; evaluation of the nursing diagnosis framework.

572 Advanced Concepts in Nursing II 3 Prereq Nurs 571. Family, community, and health systems as they relate to nursing diagnoses and treatment of health problems.

574 Advanced Nursing Practice V 3-4 Prereq Nurs 561, 571, 572. Field experience/sem inar; nursing diagnoses and interventions in management of selected client problems; clinical application of research.

581 Advanced Pathophysiology for Nursing V 2-3 Prereq graduate student in Nursing. Pathophysiology, nursing care of patients with cardiovascular, renal, gastrointestinal, and neurological disorders; selected physiological and pathophysiological processes.

583 Advanced Gerontological Nursing V 3-4 Prereq Nurs 571. Comprehensive analysis of research regarding nursing care of elderly persons; nursing interventions and health of elderly persons.

598 Advanced Topics in Nursing V 1-3 May be repeated for credit; cumulative maximum 6 hours.

599 (600) Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

Schedule of Studies

BACHELOR OF SCIENCE

The Bachelor of Science in Nursing degree requires a total of 120 semester hours. All students must meet the General University Requirements for graduation as described elsewhere in the catalog. The prenursing course requirements are indicated by an asterisk (*) in the schedule of studies listed below.

Fifty-six semester hours of credit are required in upper-division nursing major courses. Additional upper-division nursing or non-nursing electives may be required.

A grade of C or better is required in all prerequisite courses and nursing courses. Criteria for admission to the upper-division nursing major include an overall cumulative g.p.a. of 2.5 or higher and a cumulative g.p.a. of 2.5 or higher in prerequisite courses.

Freshman Year

First Semester

Engl 101 Composition 3
*Psych 105 Intro Psychology 3

Second Semester

Chem 101 Introductory 4
Soc 5 or Hum GUR 3
Humanities GUR 3

First Year

HUMANITIES

Second Semester

Practicum I 3

Sophomore Year

First Semester

Zool 315 Human Anatomy 4
Psych 311 Eleem Stat 4
Micro 101 Elementary 4

Second Semester

Zool 251 Human Physiol 3
FSHN 333 Human Nutrition 3
Nurs 200 Prof of Nursing 2
Soc 5 or Hum Elective 2

Junior Year

First Semester

Nurs 310 Pharmac Nurs 2
Nurs 312 Path Nurs 2
Nurs 320 Found Nurs 3
Nurs 321 Foundations 3
Nurs 330 Health Assessment 3

Second Semester

Nurs 313 Indiv & Family 2
Nurs 340 Parent-child 5
Nurs 341 Parent-child 6
Elective 1

Senior Year

First Semester

Nurs 401 Research 2
Nurs 402 Grp Theory Pract 4
Nurs 420 Con Adults 3
Nurs 421 Prac Adults 6

Second Semester

Nurs 403 Critical Issues 3
Nurs 440 Comm Health 3
Nurs 441 Comm Health 3
Nurs 450 Psych/MH 3
Nurs 451 Psych/MH 3

Masters of Nursing

The program consists of 50 semester credits which may be completed 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 ICNE. A thesis is required.

Core Courses

Nurs 501 Nursing Th Res I 3
Nurs 502 Nursing Th Res II 3
Nurs 507 Prof Issues 3
Nurs 508 Nursing Leader 3
Nurs 561 Transcul Nurs 3
Nurs 571 Adv Concepts I 3
Nurs 572 Adv Concepts II 3
Nurs 574 Adv Nurs Pract 3
Nurs 700 Thesis 4

Required Courses

Nursing Service Administration 3
Nurs 513 Theory and Role An 4
Nurs 514 Personnel Mgt 3
Nurs 516 Practicum 5

Required Cognates: Two upper-division/graduate level courses from another discipline (e.g., business administration) relevant to the major.

Nursing Education

Nurs 523 Theory and Role An 4
Nurs 521 Teach, Learn, and Eval 3
Nurs 526 Practicum 5

Required Cognates: Two upper-division/graduate level courses from another discipline (e.g., Education) relevant to the major.

Advanced Nursing Practice: Adult Acute Care

Nurs 533 Theory and Role An 4
Nurs 533 Adv Pathophys 4
Nurs 536 Practicum 5
Nurs 581 Adv Geront Nurs 3

Required Cognates: Two upper-division/graduate level courses from another discipline relevant to the major.

Advanced Nursing Practice: Psychiatric-Mental Health

Nurs 541 Adv Psych/MH 3
Nurs 543 Psych/MH Concept 4
Nurs 546 Pract Psych/MH 5

Required cognates: Two upper-division/graduate level courses from another discipline relevant to the major.

Program in Nutrition


The interdepartmental graduate program in nutrition is composed of faculty from the Departments of Animal Sciences, and Food Science and Human Nutrition in the College of Agriculture and Home Economics; the College of Pharmacy; and, the Department of Veterinary Microbiology and Pathology in the College of Veterinary Medicine. The program offers courses of study leading to the degrees of Master of Science and Doctor of Philosophy (Nutrition). Candidates for the PhD degree may choose either a basic science or the social and behavioral science option. Graduate training in basic and applied nutrition of man and a variety of laboratory and domestic animals is available. Specific areas of research include nutrient availability, utilization and interactions; food and feed sources; nutrition and disease; and nutritional status and requirements. Excellent facilities are available for these teaching and research objectives, including extensive WSU central facilities.

Students wishing to pursue studies leading to advanced degrees in nutrition are encouraged to obtain undergraduate training in nutrition, biological sciences, chemistry (organic, inorganic, and quantitative), physics and mathematics. The Graduate Record Examination (GRE) and three letters of reference are required for admission. Students with bachelor's degrees in food science and nutrition and animal nutrition are usually well
prepared for admission. Students from a wide variety of other fields may be admitted provided the necessary prerequisites are met. The interdisciplinary impact of other fields on nutrition encourages selection of courses in biochemistry, physiology, and statistics, as well as in nutrition, to meet course requirements. A wide variety of additional graduate courses in agricultural, biological, educational, social, and veterinary sciences are available to supplement the degree program. Doctoral students must select a collateral area that is related to but outside the field of nutrition.

Graduates will be prepared for careers in teaching, research, and extension at universities and for field representative and research positions in government, industry, and other organizations.

Description of Courses

For explanation see Index under “Symbols”

Natr

500 Seminar in Nutrition 1 May be repeated for credit; cumulative maximum 5 hours. Seminar on current research issues in nutrition.

505 Experimental Nutrition 3 (1-6) Same as A S 505. (a/y)

512 Vitamins 2 Same as A S 512. (a/y)

516 Protein and Amino Acid Metabolism 2 Same as A S 516. (a/y)

517 Lipid and Prostaglandin Metabolism 2 Same as A S 517.

518 Mineral Metabolism 3 Same as A S 518. (a/y)

521 Research Techniques in Nutrition 3 (1-6) Same as FSHN 521.

526 Community Nutrition 3 Same as FSHN 526.

530 International Nutrition 3 Same as FSHN 530.

532 Human Digestion and Absorption 3 Same as FSHN 532.

533 Pathophysiology of Human Nutrition 3 Same as FSHN 533.

598 Advanced Topics in Nutrition V 1-2 May be repeated for credit. Recent research in nutrition.

600 Special Projects or Independent Study Variable credit.

700 Master’s Research, Thesis, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Program in Pharmacology and Toxicology


The sciences of pharmacology and toxicology are important to maintenance of human health, food resources, and environmental quality. Pharmacologists and toxicologists study the interaction of chemicals with biological systems to understand their adverse effects and their useful effects for the treatment of disease. The Pharmacology/Toxicology Program consolidates the research and teaching expertise of faculty primarily in the Colleges of Pharmacy and Veterinary Medicine, and also in the departments or programs of chemistry, entomology, food science, mathematics, genetics, and zoology at WSU and in the veterinary science department at the University of Idaho. The Pharmacology/Toxicology Program is designed to prepare students for careers in research and teaching with both Master of Science and Doctor of Philosophy degrees offered.

Students entering the Pharmacology/Toxicology Program should have completed undergraduate work in biology, chemistry, including organic chemistry and biochemistry, mathematics through calculus and physiology. Deficiencies may be rectified during the first year of graduate study. Each student in the program is required to complete the core curriculum:

- Stat 512 Analysis of Variance and Experimental Design
- BC/BP 563/564 General Biochemistry
- P/T 505 Principles of Toxicology
- P/T 506 Principles of Pharmacology
- P/T 507 Principles of Pharmacology II
- P/T 597 Seminar (required each year)
- V Ph 501 Mammalian Physiology

In addition, advanced courses in pharmacology (8 credits) or toxicology (10 credits) are required for the pharmacology and toxicology tracks, respectively. Elective course work that complements each student’s research and career interests is selected by the student in consultation with his/her advisor. Each student is required to write a thesis based upon original laboratory research. The research interests of the faculty span a broad spectrum, e.g., neurochemical and central nervous system pharmacology, thrombosis and hemostasis, cardiovascular pharmacology, metabolism, teratology, aquatic toxicology, xenobiotic metabolism, design of enzyme inhibitors, and chemical residues and natural toxicants in food.

Veterinary Medicine and Pharmacy faculty in the Pharmacology/Toxicology Program are housed primarily in Weyer Hall. The building was recently remodeled and provides an excellent atmosphere for study and research. Modern instruments available for pharmacological and toxicological research include: ultraviolet, infrared, circular dichroism, fluorescence, and Fourier transform nuclear magnetic resonance spectrometers, gas and high performance liquid chromatographs, centrifuges, ultra centrifuges, an electron microscope, and scintillation counters. In addition, the building houses a health sciences library and a vivarium equipped to maintain a variety of research animals. Excellent research facilities house other members of the Pharmacology/Toxicology faculty at the University of Idaho, and at various locations on the WSU campus.

Applications for admission to the program must include GRE scores, transcripts for all college-level work, three letters of recommendation, and a description of career objectives. For students whose native language is not English, TOEFL scores are also required. Applications and inquiries should be directed to Admissions Committee Chair, Pharmacology/Toxicology Graduate Program, Pullman, WA 99164-4810.

Schedule of Studies

For explanation see Index under “Symbols”

P/T


501 Philosophy of Pharmacology and Toxicology 1 By interview only. Historical perspectives, current characteristics, and trends in pharmacology and toxicology.

505 Principles of Toxicology 3 Principles of modern, predictive toxicology; actions, biological disposition and environmental fate of natural products, drugs, pesticides, food chemicals and pollutants.

506 Principles of Pharmacology 4 Prereq biochem and physiol. Fundamental mechanisms of drug action and the factors that modify drug responses; fundamentals of medicinal chemistry.

507 Pharmacodynamics 5 Prereq P/T 506. Advanced concepts of the pharmacology, clinical uses, and chemistry of medicinal agents.

509 Clinical Anesthesiology and Pharmacology 4 (0-12) Prereq 4th year in Vet Med. Instruction and practical experience in anesthesiology; evaluation of safety and efficacy of animal drug therapy.

510 Pharmacokinetics 2 Kinetics of drug absorption, distribution, elimination, and pharmacologic response. (a/y)

511 Topics in Toxicology V 1-4 May be repeated for credit; cumulative maximum 12 hours. By interview only. Topics of current interest in toxicology and closely related areas.

512 Topics in Pharmacology V 1-4 May be repeated for credit; cumulative maximum 12 hours. By interview only. Topics of current interest in pharmacology and closely related disciplines.

525 Instrumental Methods in Pharmacology/Toxicology 3 (2-3) Prereq Chem 342. Procedures and instruments used in analytical and separation methods. (a/y)

529 Neurochemistry 3 Same as V Ph 529.

532 Metabolism of Drugs and Toxins 2 Pathways, enzymeology and mechanisms of metabolism of drugs, environmental contaminants and other xenobiotics; pharmacological and toxicological impact of metabolism. (a/y)

537 Physiology and Biochemistry of Neuropeptides 3 Same as V Ph 537.

543 Principles of Comparative Pathology 4 (3-3) Prereq 300-level Zoology course. Gross and micro pathology, histological techniques, neoplasia. Cooperative course taught at the University of Idaho (VS 515).

561 Receptorology 2 Prereq P/T 506. The role of ligand-receptor interactions in biological responses to drugs and poisons.

565 Teratogenesis, Carcinogenesis, and Mutagenesis 2 Prereq P/T 505. Toxin-induced changes in mammals resulting in teratons, neoplasms, and mutations. (a/y)
566 Target Organ Toxicity 2 By interview only. Chemical toxicity manifested in damage to structure and function of liver, kidney, lung, nerve, cardiac and skin tissue. (a/y)

567 Toxicological Testing Strategies V 1-2 Prereq P/T 505, 565. Principles of toxicity testing, decision theory, good laboratory practices, protocol development and risk assessment methods. (a/y)

597 Pharmacology and Toxicology Seminar I May be repeated for credit; cumulative maximum 12 hours. By interview only.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

College of Pharmacy


The objective of the College of Pharmacy is the development of students for a lifetime of responsible service in the pharmaceutical profession. The curriculum of the college is designed to prepare graduates for careers in retail pharmacy, hospital practice, industry, nursing homes, government, and teaching.

The schedule of studies is a five-year program made up of one preprofessional year and four professional years. The professional curriculum is built upon a solid foundation of general sciences and mathematics, and is integrated with courses in the humanities and social sciences.

Throughout the professional years of instruction, special attention is given to developing in students a concern for the total health care of patients and the general public. For example, the clinical pharmacy program on campus and in cooperating hospitals of the area emphasizes the role of the pharmacist in patient care in both institutions and community practice. The preclinical basic science courses are carefully designed to prepare students for such experience.

The College of Pharmacy initiated its clinical pharmacy teaching program in 1970. To supplement its lecture and conference courses in this area, the college requires its seniors to spend one semester off campus. During the first half of the semester, the students participate in clinical clerkships at hospitals in Spokane, Washington, where they gain experience in the delivery of health care. They spend the balance of the semester in a wide variety of health care settings, in a required externship program designed to provide them with practical professional experience.

The College of Pharmacy is accredited by the Accrediting Council on Pharmaceutical Education and is a member of the American Association of Colleges of Pharmacy. The college offers courses of study leading to the degrees of Bachelor of Pharmacy, Master of Science in Pharmacology/Toxicology, and Doctor of Philosophy (Pharmacology/Toxicology).

Description of Courses

For explanation see Index under "Symbols"

Pharmacy

Phar 101 Orientation 1 Open to all students.

217 Drugs in Our Society 2 For non-majors. The use and abuse of drugs.

300 Pharmaceutical Calculations 1 The mathematics of pharmacy to meet the needs of dispensing practitioners.

311 Pharmaceutics I 3 Prereq Math 140; Chem 340. Theory, preparation, and application of solution dosage forms.

312 Pharmaceutics II 3 Prereq Phar 311. Theory, preparation, and application of solid, semisolid, and dispersed liquid dosage forms.

313 Pharmaceutics Laboratory I 1 (0-3) Prereq Phar 311 or cr./. 1 Laboratory in the preparation of solution dosage forms.

314 Pharmaceutics Laboratory II 1 (0-3) Prereq Phar 312 or cr./. 1 Laboratory in the preparation of solid, semisolid, and dispersed liquid dosage forms.

317 Non-prescription Drugs and Health Care Accessories 2 Quality and use of non-prescription drug items and selected health care products.

342 Pharmacognosy 4 Prereq Chem 342. Poisonous plants; pharmaceutically important enzymes, vitamins, antibiotics, allergens, and biologically.

401 Clinical Pharmacy V 4-3 Prereq Phar 342, 406, 411, 436, 467, 472, 473. Biopharmaceutics and pharmacology applied to clinical situations, drug information and evaluation; disease states.

405 Professional Practice 6 (0-24) Prereq Phar 406; senior in Phar. An externship providing practical professional experience in various pharmacies under the supervision of an approved pharmacist preceptor.

406 Therapeutic Agents 3 (1-6) Prereq Phar 312, 314, 471. Professional competence in applying principles of pharmacology, medicinal chemistry and pharmacology to selecting therapeutic products; dispensing procedures; clerkship preparation.

408 Clinical Clerkship V 4 (0-12) or 8 (0-24) May be repeated for credit. Prereq Phar 401, 406. Externship providing clinical experience in the delivery of health care and the role of the pharmacist in patient care.

410 The Pharmacist and Social Health 2 The pharmacist's role in individual and group health problems.

411 Pharmaceutics III 4 Prereq Phar 300, 311, 312. Kinetics of drug absorption, distribution, and elimination; dosage regimen design; bio-availability.

412 Pharmaceutics Laboratory III 1 (0-3) Prereq Phar 300, 311, 312, 313, 314. Advanced techniques for the extemporaneous compounding of dosage forms; I.V. admixture credit.

419 Drug Induced Diseases 2 Prereq Phar 401, 406, 467, or cr./. Incidence, mechanisms, manifestations, treatment and/or prevention of drug induced diseases.

420 Pharmacy Communication Skills 2 Application of interpersonal and written communication skills for community, hospital, and institutional pharmacists.

436 Chemotherapy 3 Prereq Chem 342; Micro 101; BC/BP 364. Structure-activity relationships, mechanisms of action, and pharmacology of antimicrobial and anticancer agents.

Pharmacology

Phar 464 Toxicology 3 Prereq Phar 472. Symptomatology, prevention, treatment, and demography of toxic reactions to drugs and household, agricultural, and economic poisons.

467 Human Pathology 3 Prereq Zool 315 or cr./. A fundamental study of disease processes in man.

471 Chemical Pharmacology 4 Prereq Zool 315, 353 or cr./; BC/BP 364; Chem 342; Phar 467. Mechanisms of drug action and factors modifying drug responses; physicochemical properties of drugs; drug receptor interaction; development of drugs.

472 Pharmacodynamics 5 Prereq Phar 471. Pharmacology and medicinal chemistry of the classes of drugs.

473 Pharmacology Laboratory I 1 (0-3) Prereq Phar 411 or cr./; Phar 472 or cr./. Drug pharmacodynamics and pharmacokinetics.

499 Special Problems V 1-4 May be repeated for credit.

Pharmacy Administration

Phar 482 Pharmacy Law 2 Prereq senior in Phar. Laws relating to pharmacy and professional practice.

484 Pharmacy Administration 3 Prereq Econ 201; senior in Phar. Problems and procedures in the establishment and management of a pharmacy.

Schedule of Studies

The Bachelor of Pharmacy degree requires a total of 153 semester hours. At least 80 of the total hours for this degree must be in upper division courses.

Prepharmacy Year

First Semester Hours
Bio S 103 Introductory 4
Chem 105 Principles 4
Math 140 Math-Life Sci 4
Hum or Soc S Elective 3

Second Semester Hours
Bio S 104 Introductory 4
Chem 106 Principles 3
Chem 107 Qual Analysis 2
Com Proficiency 3
Hum or Soc S Elective 3

First Professional Year

First Semester Hours
Phar 101 Orientation 1
Chem 340 Organic 3
Chem 341 Organic Lab 2
Micro 101 Elementary 4
Com Proficiency 3
Elective2 3

Second Semester Hours
Phar 317 Drugs and Accessories 2
BC/BP 364 Biochemistry 3
Econ 201 Principles4 4
Phar 300 Phar Calculations 1
Chem 342 Organic 3
Department of Physical Education, Sport, and Leisure Studies

Second Professional Year

First Semester  
Phar 311 Pharmacology I 3  
Phar 316 Pharmacology Lab I 1  
Zool 315 Gross/Micro Anat 4  
Phar 467 Human Path 3  
Elective 3  

Second Semester  
Phar 312 Pharmacology II 3  
Phar 314 Pharmacology Lab II 1  
Phar 342 Pharmacognosy 3  
Phar 471 Chem Pharmacology 4  
Zool 333 Zoophysiology 4  

Third Professional Year

First Semester  
Phar 406 Therap Agents 3  
Phar 411 Pharmacology III 4  
Phar 436 Chemotherapy 3  
Phar 472 Pharmacodynamics 5  
Phar 473 Phar/Biopharm Lab 1  

Second Semester  
Phar 401 Clinical Pharmacy 5  
Phar 412 Pharmacology Lab III 1  
Phar 464 Toxicology 3  
Phar 482 Pharmacy Law 2  
Phar 484 Pharm Administration 3  
Phar 410 Social Health 2  

Fourth Professional Year

First Semester  
Electives (professional and non-professional) 16  

Second Semester  
Phar 408 Clinical Clerkship 8  
Phar 405 Prof Practice 8  

*Students seeking admission to the second professional year must have completed two semesters or three quarters of organic chemistry.  
*Students must complete a total of 28 hours in non-science, non-professional course work prior to graduation. This total will include the six hours of communication proficiency and the required economics course as well as the GURs in humanities or social sciences.  
*Econ 203 acceptable if Econ 201 cannot be scheduled.

Department of Philosophy

Associate Professor and Department Head, M. R. Neville; Professors, D. H. Bishop, J. E. Brown, J. C. Carbone, H. S. Silverstein; Associate Professor, G. W. Lijie.

The Department of Philosophy offers courses intended to provide the student with an introduction to fundamental intellectual problems, and both classical and contemporary attempts at their solutions. Students are encouraged to develop their own critical faculties. The department offers courses of study leading to the degree of Bachelor of Arts in Philosophy.

Description of Courses

For explanation see Index under "Symbols"

Phil 101 [H] Introduction to Philosophy 3 Nature and place of philosophy in human thought; problems and achievements

102 [C] Writing and Reasoning 3 Application of critical thinking skills to essay writing.

107 [H] Philosophy of Religion 3 Western religious thought, nature and knowledge of God, relations to science, morality, and society.

198 [H] Philosophy Honors 3 The nature of formal arguments; principles of scientific inquiry.

201 [H] Elementary Logic 3 Analysis and evaluation of deductive and non-deductive argument.

220 [H] Aesthetics 3 Philosophy of art; analysis of aesthetic experience; criteria of art criticism.

260 Ethics and Contemporary Social Issues 3 Ethics through analysis of contemporary moral and social issues.

300 [H] History of Ancient and Medieval Philosophy 3 Pre-Socrates, Plato, Aristotle; post-Aristotelian philosophy to the Renaissance. (a/y) Joint listing with the University of Idaho (Phil ID309).

305 [H] History of Modern Philosophy 3 Renaissance: 17th and 18th century philosophers. (a/y) Joint listing with the University of Idaho (Phil ID310).

310 [H] Recent and Contemporary Philosophy 3 19th and 20th century philosophers. (a/y)

314 [I] Philosophies and Religions of India 3 Prereq Phil 101 or 102. Metaphysical, epistemological, ethical, aesthetic, social, and political views of Hinduism, Buddhism, and Islam, and their influence on Indian civilization.

315 [I] Philosophies and Religions of China and Japan 3 Prereq Phil 101 or 102. The philosophies and religions of China, Japan, and their metaphysical, epistemological, ethical, social, and political positions and views of God and gods.

20th Century Philosophy 3 Prereq 3 hrs Phil. Selected major philosophers and movements in philosophy since the turn of the century.

335 Seminar in Theory of Knowledge 3 Prereq 3 hrs Phil. Problems of immediate knowledge and mediate knowledge, modes of cognition. (a/y) Joint listing with the University of Idaho (Phil ID335).

340 Seminar on Metaphysics 3 Prereq 3 hrs Phil. Theory of self, world, God, nature of being. (a/y)

360 Business Ethics 3 The principles of ethics as applied to specific problems in business faced by individuals and corporate institutions.

365 Bioethics 3 Prereq 3 hrs Bio. Ethical problems in medicine and biological research.

370 Environmental Ethics V 1 or 3 Ethical problems arising from our utilization of natural resources; case studies.

390 Topics in Philosophy 3 May be repeated for credit; cumulative maximum 6 hours.

401 Seminar in Symbolic Logic 3 Prereq 201. (a/y)

404 Current Issues in Agriculture and Home Economics 3 Same as AgHE 404.

407 Seminar in Religious Studies 3 May be repeated for credit; cumulative maximum 6 hours. Senior seminar for majors in religious studies.

410 Seminar in Philosophy of Language 3 Prereq 3 hrs Phil. Concepts of meaning, reference, linguistic knowledge; solution of related philosophical problems. (a/y)

*Open only to students in the Honors Program.

420 Existentialism 3 Prereq 3 hrs Phil. The movement of religious and non-religious existentialism beginning with Kierkegaard and Nietzsche, and including Heidegger, Sartre, Merleau-Ponty, Buber and Tillich. (a/y) Joint listing with the University of Idaho (Phil ID421).

425 Seminar in Philosophy of Science 3 Prereq 3 hrs Phil. Purpose and logical structure of science; human implications. (a/y) Joint listing with the University of Idaho (Phil ID425).

445 Seminar on Social and Political Philosophy 3 Prereq 3 hrs Phil. Problems of normative social and political theories; historical and contemporary philosophers. (a/y) Joint listing with the University of Idaho (Phil ID441).

450 Seminar in Philosophical Psychology 3 Prereq 3 hrs Phil. Theories of mind, self, mental acts, psychological states and human actions. (a/y) Joint listing with the University of Idaho (Phil ID442).

460 Seminar on Ethical Theory 3 Prereq 3 hrs Phil. Problems of ethical, historical, and contemporary philosophers. (a/y) Joint listing with the University of Idaho (Phil ID445).

470 Philosophy of Law 3 Prereq 3 hrs Phil. Selected topics pertaining to moral and philosophical evaluation of law. Cooperative course taught at the University of Idaho (Phil ID410).

499 Special Problems V 1-4 May be repeated for credit.

600 Special Projects or Independent Study Variable credit.

Schedule of Studies

At least 40 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

An undergraduate major consists of 30 hours within the department including Phil 101, 202, 300, 305, 310; 335 or 340; 445 or 460; and 9 hours electives. Students intending to use the philosophy major as a pre-law or pre-theology program should consult with the department about particular course concentrations.

The undergraduate minor consists of 16 hours of course work, at least 8 of which must be in upper-division courses. Courses are chosen by the student, but normally include Phil 101 and 201.

Department of Physical Education, Sport, and Leisure Studies


The Department of Physical Education, Sport, and Leisure Studies provides opportunities for the study of educational and service programs related to human movement, sport, and leisure. Within these areas, the department addresses the needs of all students for physical education elective activity programs; the educational demand for physical education teachers and coaches; the national
interest in exercise, fitness, and health; and the professional field of recreation and leisure services. Such topics as intramural administration, sport management, athletic training, exercise science, aquatics, dance, physical activities for the disabled, and health education are all part of the national interest in physical education, sport, and leisure services and are integral parts of this department’s offerings.

Degrees
The department offers two undergraduate degrees: the Bachelor of Science in Physical Education and the Bachelor of Arts in Recreation and Leisure Studies. Within the Bachelor of Science degree program, students may major in physical education for the secondary school, physical education for kindergarten through grade twelve, exercise science, or athletic training. Students in the Bachelor of Arts program may major in recreation and leisure studies or in sport management. On the graduate level, the department offers the Master of Science in Physical Education, Sport, and Leisure Studies. Located in the College of Education, the department also offers courses leading to a minor in physical education in the Doctor of Philosophy in Education program offered by the Department of Educational Administration and Supervision.

Teaching Minors
The department also offers teaching certification minors in physical education, health education, and coaching. For teaching minor requirements, see Department of Elementary and Secondary Education Subject-Matter Requirements.

Admission
Students enrolling in the teacher preparation major must follow Department of Elementary and Secondary Education criteria for admission. Admission to the graduate program is determined by undergraduate g.p.a. of 3.0 or acceptable GRE scores, three letters of recommendation, and transcripts of all undergraduate work.

Schedule of Studies

BACHELOR OF SCIENCE IN PHYSICAL EDUCATION

Secondary Teaching

Majors preparing to teach should consult the catalog listings of the Department of Elementary and Secondary Education for certification requirements. An approved teaching certification minor is required for certification. If the coaching certification minor is selected, students are strongly urged to select a second teaching minor.

In addition to the General University Requirements of 31 credits, all physical education students in the secondary teaching major are required to take the following courses: Zool 251, H Ed 363, 480/481, PEP 198, 199, 231, 232, 233, 234, 235, 236, 237, 238, 262, 313, 314, 315, 361, 362, 363, 364, 392 (1 cr), 481, 482, 484, 485, 486, 490, and PEACT 228.

Teaching K-12

Students majoring in Physical Education with a teaching major in kindergarten through grade 12 are required to take the secondary teaching major courses plus PEP 472, 473, and 479.

Exercise Science

In addition to General University Requirements of 31 credits, students in exercise science are required to take: Zool 251, H Ed 361, RLS 276, 375, PEP 199, 262, 311, 313, 314, 315, 361, 362, 363, 364, 476, 487, 394 (2 cr), 491 (10 cr), and 5 credits from PEP 231, 234, 238, PEACT 119, and PEACT 140. Required QURs include biology, chemistry, and FSHN 130.

Athletic Training

Students in athletic training may also want a teaching certificate. Application to the program must be made at the junior level. Because of the National Athletic Training Association’s regulations for student/faculty ratio, the program admits a limited number of students. Students are advised to consult the athletic training advisor early in their academic careers.

Required courses are: Phar 217, Zool 251, H Ed 361, 463, PEP 198, 199, 231 to 238 (9 cr), 262, 266, 311, 315, 361, 362, 363, 364, 391 (4 cr), 466 (4 cr), 484, 499 (4 cr), and FSHN 130.

BACHELOR OF ARTS IN RECREATION AND LEISURE STUDIES

General Curriculum

The Recreation and Leisure Studies curriculum is designed to provide broad-based professional preparation to students entering the recreation and leisure service profession. All students majoring in RLS must complete a core program of general education and professional recreation and leisure studies requirements. Additionally, each student will design a 22 to 24 hours area of concentration based on the student’s future professional goals.

Theory and practice are combined in preparing the student for employment in the leisure service industry. A total of 1000 hours of documented practical experience is required of all majors prior to their enrollment in RLS 491 Internship. One hundred and eighty hours of the 1000 hours are completed through credited practica. The remaining 820 hours may be accumulated through a variety of approved practical experiences. Field experiences may be paid or voluntary. No student will be allowed to begin the final internship experience if the cumulative g.p.a. is less than 2.0 at the completion of the course of study. At least 40 of the total hours required for the Bachelor of Arts degree in Recreation and Leisure Studies must be in upper-division courses.

If the cumulative g.p.a. of a certified major in RLS falls below a 2.0 any time after certification and the student becomes deficient under General University Academic Regulations 37, 38, or 39, that student will be decertified. Certification will be reinstated only if the student’s cumulative g.p.a. returns to a 2.0 and criteria established for recertification are met.

General Education Requirements: These classes have been selected to enhance the student’s general preparation and to fulfill general university requirements. SpCom 102; Engl 101 and 102; Soc 101 or 102 and 326; Psych 105 and 361; Math 103 or 116; Env S 101; Cpt S 105; FRSM 371; H Ed 363; RLS 487 or L A 363 or Arch 202.

Recreation Core Requirements: 44-46 hours

RLS 275, 285, 321, 341, 375, 383, 388. Practica in RLS 4 credits (3 practice must be selected from RLS 390-393); an additional practicum credit may be selected from RLS, PEP, or H Ed, 421, 475, 481, 488.

Area of Concentration: 22 to 24 hours selected to meet the student’s professional goals. The area of concentration is designed under consultation with and approval by the student’s advisor and the RLS curriculum committee. The course work for the area of concentration must be determined prior to the beginning of the first semester of the student’s junior year or the end of the transfer student, the second semester of the junior year.

Sport Management Major

The Sport Management major will provide professional preparation for those students wishing to pursue a management career in sport organization or sport business. Students must complete a core program of sport management and recreation and leisure studies requirements. An area of specialization is planned by the student and adviser on an individual basis. General University Requirements should be selected upon recommendation of an advisor and should include: Com 101, Psych 105, Soc 101, SpCom 102, and FSHN 130.

Sport Management Requirements: 68-70 hours

RLS 276, 285, 290, 321, 341, 375, 421, 475, 481, 487, 488, 491, 390-394 (4 cr), PEP 330, 364, PEP 231-238 and PEACT 119, 140, H Ed 363, B Law 210, Mgt 301, Mkg 360, and Cpt S 4 cr, 18 hours in an area of specialization is also required.

AREAS OF CONCENTRATION

Aquatics: (20 hours)

PEP 312, 385, 390 series or 490 (1 hr), 433, 330 or 362, H Ed 363, plus 7 hours from the following: PEP 384, 484, H Ed 463, RLS 383, 460, PEACT 130, 131, 135, 229, 233, 235.

Dance: (20 hours)

PEP 199, 231, 237, 262, 362, 357, 316 or 317, 417, plus 2 hours from PEACT 119, 120/121, 122, 127, 200, 356, RLS/PEP 490, 499, PEP 314.

Health and Wellness: (19 or 20 hours)

R LS 363, 365, FSHN 130, PEP 364, Phar 217, Psych 363, and one of the following: Psych 230, 220, Env S 111.

Physical Activity Programs for Young Children: (21 hours)

PEP 199, 370, 392 (1 hr), 472, 473, Ed/Se 301, CFS 240, CFS 342, RLS 285, H Ed 363.

Sport Management: (20 hours)

RLS 276, 290, 375, 321, 421, 475, 481.

Description of Courses

For explanation see Index under “Symbols”

Activity Courses

These courses are open to all students. PEACT courses numbered 100 through 174 are for beginners. Those numbered 177 and above are for intermediate or advanced students.

Credit: PEACT 001 is a no credit course. All other PEACT activity course credit is granted on the basis of one credit for two one-hour classes per week. PEACT courses may not be repeated for credit, with the exception of PEACT 200 Special Topics (one credit hour, repeatable to a maximum of four hours).

PEACT

001 Sport Conditioning

101 Beg Conditioning

102 Beg Cond – ROTC

106 Self Defense
dent responsibilities, personal and professional philosophy.


220 Officiating V 1 (0-3) to 2 (1-3) May be repeated for credit; cumulative maximum 4 hours. Principles and mechanics of officiating; officials' responsibilities on and off the court; officiating techniques for various sports.

231-238 Knowledge, Skills, and Basic Strategies 1 (0-3) Prereq PEP 199. 231 Recreational Dance 232 Track and Field 233 Flag Football/Volleyball 234 Softball/Basketball 235 Soccer/Golf 236 Educational Gymnastics/Tumbling 237 Performing Dance 238 Tennis/Badminton

262 (261) Human Anatomy 3 (2-3) Human skeletal structure and articulations; skeletal musculature; the nervous, respiratory, and circulatory systems. Joint listing with the University of Idaho (PE ID261).

266 Care and Prevention of Athletic Injuries 2 (1-3) Administration of school sports health care programs; prevention, treatment, and rehabilitation of sport injuries.

290 Sport Programs 3 (2-3) Same as RLS 290.

296/297 Applied Computer Technology in Physical Education, Sport, and Recreation 1 Applying computer technologies for controlling data in movement sciences, and performance activities.

300-309 Advanced Skills, Techniques, and Coaching of Sports 2 (1-3) Philosophy, safety, equipment, drills, and competition. 300 Baseball 301 Basketball 303 Football 305 Soccer 306 Softball 307 Tennis 308 Track and Field 309 Volleyball

311 Strength Training 2 (1-3) Prereq PACT 112. Basic information and guidelines needed to teach strength development-weight training programs for athletes at the high school or college level.

313 Behavioral Aspects of Human Movement 3 Prereq Psych 105 or Soc 101. Basic knowledge of psychological, sociological, cultural, and anthropological concepts as they relate to human movement.

314 Philosophy of Human Movement 3 The philosophical dimensions of physical education, sport, and dance.

315 Evaluation in Physical Education 2 (1-3) Prereq PEP 296. Tests, their administration and use, of computers, interpretation and use of statistics; formation of sound grading systems.

316 Recreational Dance Techniques 2 (0-6) Prereq PEP 231 or competency. Methods and materials for social, folk, and square dancing.

317 Performing Dance Techniques 2 (0-6) Prereq PEP 237 or competency. Methods and materials in modern dance, jazz dance, and ballet.

330 Biological and Mechanical Aspects of Sports 3 Not open to PE majors. Anatomy, physiology, psychology of exercise, and kinesiology; practical applications to coaching situations.

336 Dance Composition and Choreography 1 (0-3) May be repeated for credit; cumulative maximum 3 hours. Solo and group dances for performance and production.

357 (257) Theory of Dance 2 Historical background; philosophy.

361 Motor Skill Acquisition 3 (2-3) Prereq PEP 262; Zool 251; PEP 313. The performer and learning environment as they relate in an input-output skill learning system.

362 Kinesiology 3 (2-3) Prereq PEP 262. Basic kinesiologic and biomechanical factors of human movement.


364 Fitness 3 (2-3) Prereq PEP 362, 363 or c/. Fitness and body mechanics as related to human movement.

384 Lifeguard Training 1 (0-2) Prereq lifesaving, First Aid, CPR. Methods of lifeguarding, leading to American Red Cross Lifeguard certification.

385 (393) Methods of Water Safety Instruction 2 (1-3) Prereq PACT 235. Red Cross water safety certificates awarded to those who qualify.

390 Practicum in Coaching V 1 (0-3) to 4 (0-12) May be repeated for credit; cumulative maximum 8 hours By interview only. Supervised practicum.

391 Practicum in Athletic Training V 1 (0-3) to 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. By interview only. Supervised practicum.

392 Practicum in Physical Education V 1 (0-3) to 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. By interview only. Supervised practicum.

393 Practicum in Special Populations V 1 (0-3) to 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. By interview only. Supervised practicum.

394 Practicum in Exercise Science V 1 (0-3) to 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. By interview only. Supervised practicum.


460 Therapeutic Recreation Practices and Procedures 3 Same as RLS 460.

466 Advanced Athletic Training 1 May be repeated for credit; cumulative maximum 4 hours. Advanced theory and techniques of athletic training.


473 Physical Education for Grades 4-8: Intermediate 3 (2-3) Prereq PEP 364 or 372. Materials, methods, lab experiences for teaching "lead-up" activities and development of major motor forms and sport.

476 Advanced Laboratory Techniques in Exercise Science 3 (2-3) Prereq PEP 362, 363. Theories and techniques of measurement in biomechanics, physiology, health, and cardiorespiratory dynamics for human fitness and performance assessment.
477 The Law in Physical Education, Sport, and Athletics 3 Legal aspects of coaching, teaching, and administering sport, physical education, and athletic programs. Credit not granted for both PEP 477 and 577.

501 Trends and Issues in Physical Education, Sport, and Leisure 3 Exploration of trends and issues in physical education, sport, and leisure.

511 Health and Medical Aspects of Sport 1 or 2 Medical supervision, first aid, nutrition, conditioning policies, relationships with health service, legal implications, effects of competition and care of injuries. (SS)

514 Public Relations for Sport Programs 1 or 2 Working with the media, audiovisual and oral and written techniques for good public relations. (SS)

515 Assessment of Sport Programs and Personnel 1 or 2 (SS)

517 Applying Scientific Principles to Improving Performance 1 or 2 Scientific knowledge relating to improving athletic performance; analysis of coaching methods and individual techniques; field of exercise physiology, biomechanics and exercise physiology. (SS)

551 Assessment and Evaluation of Motor Dysfunction 3 Principles of assessment and evaluation of motor dysfunction; tools and techniques; administration, interpretation, and translation into program plans. (SS)

552 Neurological Impairment and Motor Behavior 3 Neurophysiological components of normal and abnormal motor behavior as a result of neurological impairments/dysfunction in children through the aged.

554 Mechanical Analysis of Motor Activity 3 Prerequisites: PEP 362. Fundamental laws of mechanics applied to motor activities.

561 Biomechanics 3 (2-3) Prerequisite: PEP 564. Biological and mechanical aspects of human movement.

602 Methods of Teaching Secondary Physical Education 4 (3-3) Prerequisites: PEP 481 or C/. Management, teaching styles, lesson design, and analysis of teaching.

481 Analysis of Human Movement 4 (3-3) Prerequisite senior in P.E. Development of knowledge and skills which assist the physical education teacher in planning for and responding to student skill learning.

482 Methods of Teaching Secondary Physical Education 4 (3-3) Prerequisite PEP 481 or C/. Management, teaching styles, lesson design, and analysis of teaching.

484 (463) Principles of Movement for Individuals with Disabilities 2 (1-3) to 3 (2-3) Knowledge, understanding, and skills for teaching movement activities to individuals with disabilities; practicum required.

485 Curriculum and Assessment 3 Prerequisite: PEP 482 or C/. Role and purpose of physical education in public schools; curriculum design, evaluation, and assessment of the learner, teacher, and program.

486 Senior Seminar 1 Prerequisite senior in P.E. Preparing the professional physical educator for a career of variety.

487 Facilities and Equipment for Physical Education, Recreation, and Athletics 2 or 3 Credit not granted for both PEP 487 and 587.

488 Current Issues in Sport 3 For seniors only. Administrative problems in coaching in school athletic programs based upon accepted education policies.

489 Behavioral Aspects of Coaching 3 Psychological concepts and implications for performance in sport.

490 Instructional Practicum V 1-4 May be repeated for credit; cumulative maximum 6 hours.

491 Internship V 8-12 Supervised practicum in agency or business.

496 Special Topics 1 May be repeated for credit; cumulative maximum 4 hours. Physical education, leisure, recreation, dance, health sports.

499 Special Problems V 1-4 May be repeated for credit.

501 Trends and Issues in Physical Education, Sport, and Leisure 3 Exploration of trends and issues in physical education, sport, and leisure.

511 Health and Medical Aspects of Sport 1 or 2 Medical supervision, first aid, nutrition, conditioning policies, relationships with health service, legal implications, effects of competition and care of injuries. (SS)

514 Public Relations for Sport Programs 1 or 2 Working with the media, audiovisual and oral and written techniques for good public relations. (SS)

515 Assessment of Sport Programs and Personnel 1 or 2 (SS)

517 Applying Scientific Principles to Improving Performance 1 or 2 Scientific knowledge relating to improving athletic performance; analysis of coaching methods and individual techniques; field of exercise physiology, biomechanics and exercise physiology. (SS)

551 Assessment and Evaluation of Motor Dysfunction 3 Principles of assessment and evaluation of motor dysfunction; tools and techniques; administration, interpretation, and translation into program plans. (SS)

552 Neurological Impairment and Motor Behavior 3 Neurophysiological components of normal and abnormal motor behavior as a result of neurological impairments/dysfunction in children through the aged.

554 Mechanical Analysis of Motor Activity 3 Prerequisites: PEP 362. Fundamental laws of mechanics applied to motor activities.

561 Biomechanics 3 (2-3) Prerequisite: PEP 564. Biological and mechanical aspects of human movement.

567 Scientific Foundations of Fitness 3 Scientific principles of physical fitness evaluation and exercise prescription; current research.

573 Philosophical Perspectives of Sport and Physical Activity 3 Ontological, ethical, aesthetic views; implications for participants, leaders, teachers, coaches, administrators, researchers.

575 Administrative Concepts for Physical Education, Sport and Athletics 3 Administration focusing on student behavior in organizations with specific attention to the leader, the setting, and the process.

576 Management of Physical Education, Sport, and Athletic Resources 3 Application of personnel, facility, fiscal, and information management skills to specific sport settings.

577 The Law in Physical Education, Sport, and Athletics 3 Graduate level counterpart of PEP 477; additional requirements. Credit not granted for both PEP 477 and 577.

578 Sports in Society 3 The social significance of sports as viewed from a physical education perspective; sociology of sport research.

579 Psychology and Physical Activity 3 Current research findings in psychology pertinent to the teaching and coaching of physical activities.

582 Assessment, Evaluation, and Research in Physical Education 3 Assessment and evaluation of program implementation; content, teaching, learning; application of current research in the field of pedagogy.

585 Curriculum and Instruction in Physical Education 3 Principles of curriculum construction and the process of instruction as the vehicle to implement curricular decisions.

587 Facilities and Equipment for Physical Education, Recreation, and Athletics 2 or 3 Graduate level counterpart of PEP 487; additional requirements. Credit not granted for both PEP 487 and 587.

589 Research Techniques 2 (1-3) or 3 (2-3) Application and use of research techniques and tools in physical education.

591 Intership V 3 (0-9) to 12 (0-36) May be repeated for credit; cumulative maximum 12 hours. By interview only. Internship in educational, industrial, municipal or private sports or recreational setting; direct participation in tasks, research and reporting activities.

592 Motor Learning 3 Learning theory, learning models, and experimental evidence related to learning and coaching theory. (SS)

592 Perceptual Motor Development 3 Physical growth and perceptual-motor development from the prenatal period through senescence.

593 Methods of Research 3 Application of the scientific approach to research in physical education, sport, and leisure.

596 Seminar V 1-2 May be repeated for credit.

597 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Health Education

H Ed 361 Health and Wellness 3 Knowledge of the multi-dimensional aspects of wellness and concepts necessary for a positive lifestyle through self-assessment.

363 First Aid 2 (1-3) Advanced first aid; accident prevention. American Red Cross certification awarded to those who qualify.

363 School Health Instruction 3 Prerequisite: H Ed 361, EL/SE 303 or 305 or C/. Methods, materials, and resources.

754 Methods of First Aid Instruction 2 (1-3) Prerequisite: first aid cert. Red Cross Standard First Aid Instructor training; certificates awarded to those who qualify.

481 School Health Programs 3 Prerequisite: EL/SE 303, 305, 306. Health promotion and problems confronting school-aged children within the dimensions of the School Health Program.

490 Instructional Practicum V 1-4 Same as PEP 490.

499 Special Problems V 1-4 May be repeated for credit.

Recreation and Leisure Studies

RLS 221 Outdoor Recreation 2 (1-3) Activities, equipment, safety, environmental impact, and skills basic to outdoor recreation.

231 Recreational Dance 1 (0-3) Same as PEP 231.

275 Leisure in Society 3 The leisure movement in society; history, philosophies, trends, socio-economic values; professional responsibilities within governmental and non-governmental agencies.

276 Introduction to Sport Management 2 Nature of sport management; scope of sport related business; related literature.

284 Recreation Activities 2 (1-3) Development of theories, knowledge, and skills in a variety of recreation activities.

285 Recreation Leadership 3 (2-3) Prerequisite: RLS 275. Theories and techniques of leadership.

290 Sport Programs 3 (2-3) Philosophies and program content of public/private sport programs; laboratory experiences in school, college, and community sport programs.

310 Outdoor Education 3 (2-3) History, philosophy, and programs in outdoor education; environmental awareness; developing strategies in outdoor education. (SS)

316 Recreational Dance Techniques 2 (0-6) Same as PEP 316.

321 Social Psychology of Leisure and Recreation 3 Prerequisite: RLS 275, 285; Psych 105, Soc 101 or 102. Research and literature related to the social psychological aspects of leisure and recreation.

341 Commercial Recreation 2 Prerequisite: RLS 285. Identification, organization, and function of
the various types of commercial recreation businesses; recreation as a business.

371 Wildland Recreation 3 Same as FRM 371.
373 Interpretive Techniques 3 (2-3) Same as FRM 373.

375 Recreation Programming 3 (2-3) Prereq RLS 285; certified major in PE or RLS. Current principles and practices in recreation program planning.

383 Therapeutic Recreation Service 3 Prereq RLS 285. The rationale for therapeutic recreation delivery systems and services and their relationships to the treatment setting.

388 Urban Parks 2 (1-3) Prereq RLS 285. Management, planning, and design of urban parks and recreation resources.

390 Practicum in Commercial Recreation V 1 (0-3) to 4 (0-12) May be repeated for credit, cumulative maximum 8 hours. By interview only. Supervised practicum.

391 Practicum in Municipal/Agency/V 1 (0-3) to 4 (0-12) May be repeated for credit, cumulative maximum 8 hours. By interview only. Supervised practicum.

392 Practicum in Parks/Facilities 3 Prereq V 1 (0-3) to 4 (0-12) May be repeated for credit; cumulative maximum 6 hours. By interview only. Supervised practicum.

393 Practicum in Therapeutic Recreation V 1 (0-3) to 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. By interview only. Supervised practicum.

394 Practicum in Sport Management V 1 (0-3) to 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. By interview only. Supervised practicum.

401 Assessment in Recreation and Leisure 3 Prereq RLS 321; approved stat course. Designing, implementing, and interpreting the information generated by instruments which evaluate recreation and leisure needs, leisure service programs, and personnel.

403 Therapeutic Recreation Practices and Procedures 3 Prereq RLS 383. Disabling diseases, injuries, and afflictions of the ill and handicapped; implications for recreation program planning and delivery.

411 Wildland Recreation Management 3 (2-3) Same as FRM 471.

473 Physical Education for Grades 4-8: Inter- 3 (2-3) Same as PEP 473.

475 Leisure Services Administration I 3 Prereq RLS 375. Process of planning and marketing leisure products; management of agency personnel.

481 Leisure Services Administration II 3 Prereq RLS 375, 475. Principles underlying the organization, financing, and administration of leisure service delivery systems.

483 Seminar in Therapeutic Recreation 2 Prereq RLS 275, 285, 375, 383. Therapeutic recreation; leisure counseling, needs of specific populations, new techniques and terms.

484 Principles of Movement for Individuals with Disabilities 3 Same as PEP 484.

487 Facilities and Equipment for Physical Education, Recreation, and Athletics 2 or 3 Same as PEP 487.

488 Current Trends in Parks and Recreation 2 Prereq RLS 275, 375, 475. Current trends and issues in parks and recreation; professional development, internship procedures, and employment procedures.

490 Instructional Practicum V 1-4 Same as PEP 490.

491 (489) Internship V 8-12 By interview only. Supervised practicum in agency or business.

499 Special Problems V 1-4 May be repeated for credit.

522 Administrative Perspectives 3 Administrative problems: Communication skills; public relations, personnel motivation and management; interagency cooperation; community economic, political, and social environment.

525 Socio-Economic Aspects of Travel and Tourism 3 Socio-economic characteristics impacting on non-business travel in the U.S. and the emerging economic importance of international travel.

526 Commercial Recreation Operations 3 Development potential, capital and managerial requirements, facility development, and sources of technical assistance.

529 Historical and Philosophical Concepts of Leisure 3 Past and current literature related to objectives and values of recreation; analysis of philosophical beliefs.

590 Internship V 3 (0-9) to 12 (0-36) May be repeated for credit; cumulative maximum 12 hours. By interview only. Internship in educational, industrial, municipal or private sports or recreational setting; direct participation in tasks, research and reporting activities.

596 Seminar 1 May be repeated for credit; cumulative maximum 3 hours. Issues, trends, history, and concepts related to leisure.

Transfer Students
Transfer students should note the sequence of professional requirements in specialized areas. For information regarding acceptability of professional courses taken at other institutions, prospective students should communicate with the department chair.

Preparation for Graduate Study
For admission to graduate study in physical education, a student should have a bachelor's degree and should present evidence of proficiency in academic work. Normally the applicant should have an undergraduate major in physical education or recreation and park administration; however, candidates with a good record in related fields may be well prepared for certain areas of advanced study in physical education.

Department of Physics


Physics is sometimes defined as the science of matter and energy and interaction between the two. In any case it is the study of nature at its most fundamental level. As such it is the science upon whose principles all of the other sciences, as well as the technologies, are based. Because it is so basic, a major in physics is ideal preparation, not only for further study in physics, but also for advanced study in such diverse fields as biology, medicine, astrophysics, geophysics, chemical physics, engineering, meteorology, and computer science. The same area also offers careers for the physics major.

Courses offered by the physics department are designed to introduce the student to each of the major physical theories. Additional undergraduate courses use these theories to investigate such topics as optics, atomic physics, nuclear physics, solid state physics, astrophysics and geophysics. Well-equipped laboratories the student tests the theories and learns some of the standard experimental techniques needed to work with modern apparatus such as computers, high-vacuum equipment, lasers, electronic devices, and accelerators.

Graduate research programs supported in part by U.S. Government grants and contracts, are being pursued in the following fields: acoustics (radiation pressure and scattering); astronomy (luminosity calibration, spectroscopy, statistics); nuclear physics (meson capture and nuclear absorption phenomena, properties of solid dielectric track detectors); optics (scattering, Fourier spectroscopy); physics education (use of micrometers in teaching and labs); solid state physics (interaction of intense beams with optical materials, fracture of solids, defects in semiconductor materials); shock wave physics (finite amplitude wave propagation, material properties under high pressure, dynamic mechanical failure, shock induced cavitation in liquids); surface and chemical physics (molecular interactions with surfaces, reactive etching of surfaces, photoelectic and thermal emission microscopy), theory (quantum theories of measurement and state preparation, equations of state, energy sources and environment). These research groups offer graduate students the opportunity to pursue the original investigations required for advanced degrees. Undergraduate physics majors are encouraged to participate through the special problems course (Phys 499) or 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).

Description of Courses

For explanation see Index under "Symbols"

Phys

101 [P] General Physics 4 (3-3) Fundamental principles and applications of mechanics, heat, and sound; oriented toward non-physical science majors.

102 General Physics 4 (3-3) Prereq: Phys 101. Fundamental principles and applications of optics, electricity, magnetism, and atomic and nuclear physics; oriented toward non-physical science majors.


303 Modern Physics 3 Prereq Math 172; Phys 202. The quantum and relativity theories with applications from atomic, nuclear and solid state physics.


538 Topics in Modern Astrophysics 3 May be repeated for credit; cumulative maximum 9 hours. Same as Astr 338.

541 Electromagnetic Radiation 3 Prereq Phys 571, 572 or C/ Special relativity and the classical electromagnetic field; emission, propagation, and absorption of electromagnetic waves.

542 Electrodynamics 3 Prereq Phys 541, 552 or C/ Interaction of matter and electromagnetic radiation; classical and quantum electrodynamics.

550 Quantum Mechanics 3 Graduate level counterpart of Phys 450; additional requirements. Credit not granted for both Phys 450 and 550.

551 Quantum Theory I 3 Prereq Phys 571, 572 or C/ Physical and mathematical foundations; wave mechanics, bound states, and collision theory; matrix mechanics, approximations methods.

552 Quantum Theory II 3 Prereq Phys 551. Symmetry and covariance, angular momentum, formal theory of scattering; relativistic wave mechanics; second quantization.

561 Atomic and Molecular Phys 3 Graduate level counterpart of Phys 461; additional requirements. Credit not granted for both Phys 461 and 561.

563 Physics of the Solid State 3 Graduate level counterpart of Phys 463; additional requirements. Credit not granted for both Phys 463 and 563.

565 Introductory Nuclear Phys 3 Graduate level counterpart of Phys 465; additional requirements. Credit not granted for both Phys 465 and 565.

571 Methods of Theoretical Phys 3 Prereq Math 440, 441. Mathematical methods for theorectical physics; linear algebra, tensor analysis, complex variables, differential equations, integral equations, variational calculus, and group theory.

575 Advanced Solid State Phys 3 Prereq Phys 334, 452, 552, 571. Quantum theory of solids; Green's functions, correlation functions and other field-theoretic methods; magnetism, superconductivity and transport properties.


580 Special Projects V 1-4 May be repeated for credit.

581 Classical Mechanics I 3 Laws of motion as developed by Newton, d'Alembert, Lagrange, and Hamilton; dynamics of particles and rigid bodies.

585 Thermodynamics 3 Prereq Phys 330; Math 440. Physical theories of equilibrium thermodynamics and irreversible thermodynamics with applications in thermogenetics, superfluids, and superconductivity.

597 Seminar in the Foundations of Physics 1 May be repeated for credit; cumulative maximum 2 hours. Advanced seminar in mathematical and philosophical foundations of physics.

598 Teaching Undergraduate Phys 3 Laboratory 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.

600 Special Projects Independent Study 1-4

700 Master's Research Thesis 1, 2

792 Master's Special Problems Directed Study 1-4

800 Doctoral Research Dissertation 1-12

Schedule of Studies

At least 40 of the total hours required for the bachelor's degree in this program must be in upper-division hours.

A major in physics requires Phys 201, 202, 303, 304, 310, 320, 330, 341, 431, 432, 435, 466, 490 (1 hr.), 490 (1 hr.); Math 171, 172, 220, 273, 315 plus at least 6 hours from 371, 375, 410, 440, 441, or 448; Chem 105, 106, and 107 (or Chem 115, 116, and 117); Engl 201; Cpt S 150. Optional physics courses include Phys 435, 443, 445 as well as additional 499 credit.

Physics majors with interests in such fields as chemical physics, biophysics, geophysics, astrophysics, engineering physics, and computer science, are urged to consult the departmental adviser for modifications of the requirements listed above. A minor in physics is also offered.

Transfer Students

Transfer students receive credit for equivalent courses taken elsewhere, but must meet the requirements for graduation listed above.

Preparation for Graduate Study

Students contemplating graduate work in physics should consider Phys 443, 450, 521, 571 and additional mathematics courses. At least one year of German, Russian, or French should also be taken.
Plant pathology is the study of plant diseases, including causes, economic consequences, epidemiology, and control. Opportunities for graduates in plant pathology include positions in research and development, teaching, extension, and sales. Plant pathologists are employed throughout the world by industries, governments, educational institutions, and private foundations.

A limited undergraduate program is designed to provide a broad background in the biological, physical, and agricultural sciences. However, 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 integrated pest management curriculum (see below).

The courses offered in this department are designed both to train students expecting to make plant pathology or mycology their professional field of specialization and to provide supplementary training for students in other biological and agricultural fields, particularly agronomy, botany, horticulture, forestry, and entomology. Students who expect to become professional plant pathologists are advised to include in their undergraduate studies fundamental courses in bacteriology, botany, chemistry, genetics, physics, and zoology.

A professional career in plant pathology requires graduate training, and the four-year course outlined under the schedule of studies is basic for such later specialization. Students often enter advanced work in plant pathology following a major in biology, botany, agronomy, horticulture, or similar areas as well as from plant pathology. Specialized areas of advanced study include mycology, nematology, virology, epidemiology, disease physiology, host-parasite relationships, ecology of disease development, biochemistry of pathogenicity, disease resistance, chemical control, and air pollution. Research is conducted on diseases of grain crops, forage crops, forest trees, fruit, vegetables, ornamentals, and turf.

The department offers courses of study leading to the degrees of Bachelor of Science in Agriculture, Master of Science in Plant Pathology, and Doctor of Philosophy.

An interdisciplinary curriculum in integrated pest management is available to those whose interests span the areas of plant pathology and pest management. The curriculum is described under the Adult and Youth Education section of this bulletin.

Description of Courses

For explanation see Index under "Symbols"

PI P
331 Forest Pathology 3 (1-6) Prereq Bio S 103. Parasitic and non-parasitic diseases of forest and shade trees; life histories of fungi as related to disease.

405 Diseases of Washington Crops 3 (2-3) Prereq PI P 429. Diagnosis and management of diseases of the important crops in Washington. Not open to graduate majors in PI P. (a/y)

421 General Mycology 4 (2-6) Prereq Bot 201. The structure, life histories, classification, and economic importance of the fungi. (a/y)

429 (329) General Plant Pathology 3 (2-3) Prereq Bio S 103 or Bot 120. Classification, symptoms, causes, epidemiology, and control of diseases of economic plants.

440 Economic Plant Pathology 3 (0-9) Prereq PISC 305. Techniques of isolation, identification, crop loss assessment and control of plant parasitic nematodes. Cooperative course taught at the University of Idaho (PIsc ID440).

472 Biology of Fungi 2 Prereq Bio S 203. Life activity of fungi; structure, life-history, and classification. (a/y) Cooperative course taught at the University of Idaho (Bot ID421/S21).

473 Fungi in the Laboratory 1 (0-3) Prereq PI P 472 or c/ c/. Culture, experimentaiton, isolation, and morphology of fungi. Cooperative course taught at the University of Idaho (Bot ID422/S22).

475 Post-Harvest Pathology 3 (2-3) Prereq PISC 305. Pathologic conditions responsible for post-harvest loss of food crops; visual aids and fresh specimens. Cooperative course taught at the University of Idaho (PISC ID475).

499 Special Problems V 1-4 May be repeated for credit.

501 Diseases of Plants 4 (3-3) Prereq PI P 429. Representative types of plant diseases (non-infectious, bacterial, fungal, viral).

503 Principles and Practices of Plant Disease Control 2 Prereq PI P 501. Biological, cultural, genetic, chemical, and legal bases of plant disease control. (a/y)

511 Viruses and Virus Diseases of Plants 4 (3-3) Prereq course in biochem, or adv genetics. Nature of plant viruses, vector-virus relationships and variants.

512 Methods in Plant Virus Research 3 (2-3) Prereq PI P 511. Laboratory and greenhouse research methods used for serology, identification, characterization, and transmission of plant viruses. (SS)

513 Nematoles and Nematode Diseases of Plants 2 (1-3) Prereq PI P 429. Anatomy, identity, and diseases caused by nematodes; techniques and control. (SS)

514 Phytopathology 4 (3-3) Prereq BC/BS 364; Micro 201. Isolation and characterization of bacteria having a saprophytic, symbiotic or pathogenic association with plants—symbiotic bacteria and plant genetics. (a/y)

515 Seminar 1 May be repeated for credit.

522 Basidioscytes 3 (2-3) Prereq PI P 421. Taxonomy, physiology, and reproduction of rusts, jelly fungi, smuts, and higher basidioscytes. (a/y)

523 Ascycytes and Fungi Imperfecti 2 (1-3) Prereq PI P 421. Taxonomy, phylology, reproduction of ascycytes, and fungi imperfecti. (a/y)

524 Lower Fungi 2 (1-3) Prereq PI P 421. Taxonomy, phylology, physiology, and reproduction of aquatic and terrestrial phycymycetes and myxomycetes. (a/y)

535 Physiology and Genetics of Parasitism 3 Prereq BC/BS 364; GenCB 301. Genetic and physiologic aspects of host-parasite interactions. (a/y)

540 Seed Pathology 3 (2-3) Prereq PI P 429. Seedborne pathogens including fungi, bacteria, viruses, and diseases of their infection, and relation to spread of plant diseases. (a/y) Cooperative course taught at the University of Idaho (PISC ID540).

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Schedule of Studies

At least 40 of the total hours required for the bachelor's degree in this program must be in the upper-division courses.

The following lists include the departmental requirements for the undergraduate plant pathology curriculum. Students should consult their advisers for appropriate sequencing of courses and in selecting electives consistent with vocational and professional objectives. They should also check fulfillment of general university requirements.

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<td>Bio S 103</td>
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Preparation for Graduate Study

As preparation for work toward an advanced degree a student should have completed a bachelor's degree; one year each of general inorganic chemistry, botany, zoology, physics, and German; one semester each of systematic botany, plant physiology, bacteriology, general plant pathology, entomology, precalculus, organic chemistry, and report writing or advanced composition.

Plant Physiology


Graduate study leading to degrees of Master of Science in Plant Physiology and Doctor of Philosophy is offered as an interdepartmental curriculum by the graduate faculty from the Departments of Agronomy and Soils, Botany, Horticulture and Landscape Architecture, Plant Pathology, the Program in Biochemistry and Biophysics, and the Institute of Biological Chemistry. The objectives of the program are to provide the graduate student with a broad knowledge in plant physiology 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 phloem transport, nitrogen fixation, phytochemistry, the physiology of plant stress 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 elementary biology or botany, physics (one year of each), chemistry through one semester of organic chemistry, one semester each of plant physiology 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 for both the MS and PhD degrees include courses in advanced plant physiology, plant morphology and anatomy, and biochemistry. Additional requirements for the PhD include physical chemistry (or related course) experimental techniques, and plant biochemistry. To meet the minimum requirements for 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 Plant Physiology or to any participating academic unit. Should the latter route be followed, preference for the program in Plant Physiology must be indicated and, if possible, the research area of interest identified.

The program offers flexibility for students with varied backgrounds in chemistry, biochemistry, plant physiology, molecular biology, botany, biology, and the agricultural sciences to pursue advanced training in plant physiology, 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 plant physiologists and 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.

Financial support for students in the program is determined within the administering academic unit and not by Plant Physiology. 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 cooperating departments and programs. In addition, a non-credit seminar is held weekly during each semester.

Courses in political science are offered in six principal fields: public policy formation, comparative government, public law, public administration, international politics and organization, and political theory and methodology.

The department offers courses of study leading to the degrees of Bachelor of Arts in Political Science, Master of Arts in Political Science, and Doctor of Philosophy.

The department also is the locus of the Criminal Justice Program, which offers courses of study leading to the Bachelor of Arts in Criminal Justice and the Master of Arts in Criminal Justice. For details, see the Criminal Justice section of this bulletin.

Pre-law Studies
No specific major is necessary to be eligible for law school. The Department of Political Science Pre-law Advising Center assists all students interested in law school regardless of their intended major.

Through its prelaw curriculum, Option II, the department offers students a selection of courses specially designed to prepare them adequately for law school. This curriculum has been prepared on the basis of recommendation of the Association of American Law Schools. Students who choose other departmental options may also be eligible to attend law school if they meet admission requirements.

Public Service
Government is now the nation's largest employer. Many thousands of these officials are political science graduates. The department will be glad to advise students concerning training and career opportunities in federal, state, and local governments, in the foreign service, and related fields.

Division of Governmental Studies and Services
A unit of the Department of Political Science, the Division of Governmental Studies and Services (DGSS), is an instrument for extending beyond the classroom and into public service the resources represented in the department's teaching and research personnel. Specifically, the functions of the division include the following: performing research and issuing publications relating to government and public affairs; providing training and consulting services to public agencies and private organizations concerned with public affairs; and maintaining liaison with governmental intern programs which afford practical government work experience for students who desire it. The DGSS maintains a collection of specialized government publications of current interest and, in general, acts as a link between the teaching of government and the conduct of public affairs.

Teaching
It is possible to obtain the bachelor's degree in political science while meeting the requirements for a Washington teaching certificate. Information, in addition to that given under Option IV below, can be obtained from the department.

Minor
A minor in political science requires a minimum of 16 semester hours, half of which must be in upper-division courses.

Description of Courses
For explanation see Index under "Symbols"

General and Introductory Courses
Pol S
102 [S] Introduction to Comparative Politics 3
Nature of the state; fundamental problems of government and politics; and ideological and institutional comparison of democracies and dictatorships.
198 [S] Political Science Honors 3
206 State and Local Government 3 Institutions, processes, and problems, with special reference to the state of Washington. Fulfills Washington teaching certification requirements.
222 [S] International Politics 3 Creation and operation of national, international, and supranational communities; major world problems since 1945.

Political Theory and Methodology
Pol S
301 Political Simulations 2 Prereq Pol S 101. Preparation for and participation in political simulations. Must be taken simultaneously with a designated upper-division political science course.
333 [S] Development of Marxist Thought 3 Marxist theory from the original writing of Marx and Engels to contemporary developments.
418 (403) Human Issues in International Development 3 Same as Anth 418.
434 American Political Thought 3 The genesis and development of political thought in the United States. Credit not granted for both Pol S 434 and 534. (s/y)
437 Classical Political Thought 3 The development of political philosophy from the pre-Socratics to Machiaveli.
438 Recent Political Thought 3 The development of political thought since Machiaveli.
477 Medicine and Politics 3 PolITICAL dimensions of biomedical technological growth; conflict between individual rights and societal interests; the role of government in the conflict. Credit not granted for both Pol S 477 and 577. Cooperative course taught at the University of Idaho (PolSc ID477/577).
496 Computer-Aided Research in Political Science 3 Prereq course in stat. Mainframe and microcomputer applications for political science research, practical application.
530 The Scope of Political Science 3 Prereq 12 hrs Pol S. Historical development and present status of the discipline; contemporary issues and future trends. Joint listing with the University of Idaho (PolSc ID530).
531 Research Methods in Political Science 3 Prereq 12 hrs Pol S; Soc 321. Development of research designs; methods of data collection; analysis of data; data processing and computer applications. Joint listing with the University of Idaho (PolSc ID531).
534 American Political Thought 3 Graduate level counterpart of Pol S 434; additional requirements. Credit not granted for both Pol S 434 and 534.
539 Teaching Political Science 1 Methods, problems, and purposes of teaching introductory political science courses in college with practice teaching and video replay.

Open only to students in the Honors Program.
577 Medicine and Politics 3 Graduate level counterpart of Pol S 477; additional requirements. Credit not granted for both Pol S 477 and 577. Cooperative course taught at the University of Idaho (PoSc ID477/577).

594 Seminar in Political Theory 3 May be repeated for credit; cumulative maximum 6 hours. Joint listing with the University of Idaho (PoSc ID594).

Comparative Government

Pol S 375 Chicano/Latino Politics 3 Same as Ch St 375.

412 Government of the USSR 3 Institutions and politics of the Soviet Union. Credit not granted for both Pol S 412 and 512.

413 Latin American Governments 3 Institutions and political processes of selected Latin American republics. Credit not granted for both Pol S 413 and 513. (a/y)

418 (462) Human Issues in International Development 3 Same as Anth 418.

435 Politics of Developing Nations 3 Issues and problems of political development and modernization common among developing nations. Credit not granted for both Pol S 435 and 535.

436 Comparative Politics: China and Japan 3 Government, politics, and society of two major Asian powers. Credit not granted for both Pol S 436 and 536.

472 Government of Great Britain 3 Political institutions and policy-making processes in Great Britain. Credit not granted for both Pol S 472 and 572.

473 Governments of France and the German Federal Republic 3 Political institutions and policy making processes in France and the German Federal Republic. Credit not granted for both Pol S 473 and 573.

474 African Politics 3 Same as Bl St 474.

512 Government of the USSR 3 Graduate level counterpart of Pol S 412; additional requirements. Credit not granted for both Pol S 412 and 512.

513 Latin American Governments 3 Graduate level counterpart of Pol S 413; additional requirements. Credit not granted for both Pol S 413 and 513.

535 Politics of Developing Nations 3 Graduate level counterpart of Pol S 435; additional requirements. Credit not granted for both Pol S 435 and 535.

536 Comparative Politics: China and Japan 3 Graduate level counterpart of Pol S 436; additional requirements. Credit not granted for both Pol S 436 and 536.

572 Government of Great Britain 3 Graduate level counterpart of Pol S 472; additional requirements. Credit not granted for both Pol S 472 and 572.

573 Governments of France and the German Federal Republic 3 Graduate level counterpart of Pol S 473; additional requirements. Credit not granted for both Pol S 473 and 573.

587 Seminar in Political Violence 3 Meaning, measuring, patterns, causes, theories, consequences of political violence. Cooperative course taught at the University of Idaho (PoSc ID587).

595 Seminar in Comparative Politics 3 May be repeated for credit; cumulative maximum 6 hours. Joint listing with the University of Idaho (PoSc ID595).

International Politics and Organization

Pol S 421 International Law 3 Law of peace, status of war, and pacific settlement. Credit not granted for both Pol S 421 and 521.


425 American Diplomatic History 1776-1914 3 Same as Hist 411. Credit not granted for both Pol S 425 and 525.

426 American Diplomatic History in the 20th Century 3 Same as Hist 412. Credit not granted for both Pol S 426 and 526.

427 United States Foreign Relations 3 Ends and means in foreign policy: organization, management, control, and current policy issues. Credit not granted for both Pol S 427 and 527.

429 European Diplomacy Since 1914 3 Same as Hist 461. Credit not granted for both Pol S 429 and 529. (a/y)

521 International Law 3 Graduate level counterpart of Pol S 421; additional requirements. Credit not granted for both Pol S 421 and 521.

523 International Organization and Administration 3 Graduate level counterpart of Pol S 423; additional requirements. Credit not granted for both Pol S 423 and 523.

525 American Diplomatic History, 1776-1914 3 Same as Hist 511. Graduate level counterpart of Pol S 425; additional requirements. Credit not granted for both Pol S 425 and 525.

526 American Diplomatic History in the 20th Century 3 Same as Hist 512. Graduate level counterpart of Pol S 426; additional requirements. Credit not granted for both Pol S 426 and 526.

527 United States Foreign Relations 3 Graduate level counterpart of Pol S 427; additional requirements. Credit not granted for both Pol S 427 and 527.

529 European Diplomacy Since 1914 3 Same as Hist 561. Graduate level counterpart of Pol S 429; additional requirements. Credit not granted for both Pol S 429 and 529.

561 Seminar in U.S. National Security Policy 3 U.S. defense and arms control policies; current strategies and weapons issues. Joint listing with the University of Idaho (PoSc ID561).

575 Seminar in Theoretical Approaches to International Relations 3 Group dynamics, systems analysis, decision-making, communications models, game theory, simulations, and rationality models.

590 Seminar in U.S. Foreign Policy 3 May be repeated for credit; cumulative maximum 6 hours. Prereq one course in international relations, international law, organization, or American foreign relations. Methodology, decision-making institutions and processes. Joint listing with the University of Idaho (PoSc ID590).

Public Policy Formation

Pol S 305 Gender and Politics 3 Role of gender in political behavior; voting and political participation; women as subjects and objects of political systems.

317 Mass Media and the Political Process 3 Relationship between the media and American political institutions and the public. (a/y)

318 Political Parties and Pressure Groups 3 Theories of parties; characteristics of American parties; organization and behavior of pressure groups.

324 Black Politics 3 Political culture, roles, and strategies of Black people in the United States; impact upon public policy.

404 The Judicial Process 3 Same as Pol S 404 below.

416 Introduction to Policy Analysis 3 Analysis of public policy formation, evaluation and implementation.

417 The Electoral Process 3 Measurement and interpretation of electoral behavior; factors influencing the electorate; voter competence; representation of the electorate. Credit not granted for both Pol S 417 and 517.

450 The Legislative Process 3 Role of legislatures in a democratic system; problems of representation; election and tenure of lawmakers; legislative organization and procedures. (a/y)

455 The Presidency 3 Organization and processes of executive institutions at the national level; uses and limits of executive power. Credit not granted for both Pol S 455 and 555.

517 The Graduate School 3 Graduate level counterpart of Pol S 417; additional requirements. Credit not granted for both Pol S 417 and 517.

555 The Presidency 3 Graduate level counterpart of Pol S 455; additional requirements. Credit not granted for both Pol S 455 and 555.

556 Governmental Policy and Program Analysis 3 Identification and analysis of policy alternatives in government including experience of preparation of policy analysis for use in governmental agencies. Cooperative course taught at the University of Idaho (PoSc ID556).

591 Seminar in Public Policy Formation 3 May be repeated for credit; cumulative maximum 6 hours. Joint listing with the University of Idaho (PoSc ID591).

Public Administration

Pol S 422 Public Administration and Program Management in Developing Countries 3 Same as Ag Ec 422. (SS)

440 Introduction to Public Administration 3 Basic theories of administrative organization, relationships, and behavior. Credit not granted for both Pol S 440 and 540.

443 Administrative Regulation 3 Government control over the economy focusing upon the administrative regulatory processes, their environment, and techniques. Credit not granted for both Pol S 443 and 543.

445 Public Personnel Administration 3 Development of American civil service systems and concepts; problems and techniques involved in selection and management of public employees. Credit not granted for both Pol S 445 and 545.

446 Public Budgeting 3 The government budget as an instrument of politics, planning and control; organizing for democratic accountability. Credit not granted for both Pol S 446 and 546.

455 The Presidency 3 Same as Pol S 455 above.

501 Seminar in Public Administration 3 Cooperative course taught at the University of Idaho (PoSc ID501).
540 Introduction to Public Administration 3
Graduate level counterpart of Pol S 446; additional requirements. Credit not granted for both Pol S 440 and 540.

543 Administrative Regulation 3 Graduate level counterpart of Pol S 443; additional requirements. Credit not granted for both Pol S 443 and 543.

545 Public Personnel Administration 3 Graduate level counterpart of Pol S 445; additional requirements. Credit not granted for both Pol S 445 and 545.

546 Public Budgeting 3 Graduate level counterpart of Pol S 446; additional requirements. Credit not granted for both Pol S 446 and 546.

552 Seminar in Administrative Theory 3 Major writers in political theory and concepts; leadership, supervision, authority, decision-making and human relations. Cooperative course taught at the University of Idaho (PolSc ID552).

555 The Presidency 3 Same as Pol S 555 above.

557 Government Budgeting 3 Federal, state, city, and county budgeting systems. Cooperative course taught at the University of Idaho (PolSc ID557).

565 The Government of Metropolitan Areas 3 Political processes, roles, institutions, and problems. (a/9)

592 Topics in Public Administration 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Pol S 440 or 445. Joint listing with the University of Idaho (PolSc ID592).

Public Law

Pol S

300 The American Constitution 3 Prereq Pol S 101. Constitutional principles as established by the Supreme Court and related political developments.

402 Civil Liberties 3 Prereq Pol S 101. Origin and development of civil liberties; responsibility of the branches of government and the people for their maintenance.

404 The Judicial Process 3 Prereq Pol S 101. Relationship of judicial behavior to structure, politics, and character of other participants in the judicial process.

421 International Law 3 Same as Pol S 421 above.

443 Administrative Regulation 3 Same as Pol S 443 above.

521 International Law 3 Same as Pol S 521 above.

593 Seminar in Public Law 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Pol S 300. Emphasis on substantive law or judicial process. Joint listing with the University of Idaho (PolSc ID593).

Problems, Seminar, and Research and Thesis

Pol S

497 Political Science Internship V 1-12 May be repeated for credit; cumulative maximum 12 hours. Prereq Pol S 101 or 206. Participation as intern in federal, state, or local governmental unit.

499 Special Problems V 1-4 May be repeated for credit.

599 Research Practicum V 1-3 May be repeated for credit; cumulative maximum 6 hours.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Study Abroad

Pol S

401 Topics in Political Science 3 Study Abroad (London).

403 Topics in Political Science 3 Study Abroad (London).

405 Topics in Political Science 3 Study Abroad (Avignon).

407 Topics in Political Science 3 Study Abroad (Avignon).

409 Topics in Political Science 3 Study Abroad (Cologne).

411 Topics in Political Science 3 Study Abroad (Cologne).

415 Topics in Political Science 3 Study Abroad (Guadalajara).

419 Topics in Political Science 3 Study Abroad (Guadalajara).

Schedule of Studies

At least 40 of the total hours required for the bachelor's degree in these programs must be in upper-division courses.

Students wishing to take Pol S 499 may have at least junior standing and consent of the instructor; no more than 3 hours of 499 or 6 hours of 497 may be counted toward the departmental Political Science requirements.

Option I. Political Science

Option I is designed to provide maximum flexibility for students desiring general undergraduate training in political science, preparing for graduate work in political science, or aiming for the U.S. Foreign Service entrance examinations. Requirements for graduation include 30 hours of Pol S, at least 12 of which must be earned at WSU.

Before undertaking this schedule of studies, a student should have fulfilled most of the graduation requirements of the College of Sciences and Arts. The following courses, some of which meet these requirements, are strongly recommended, but not required.

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Pol S 101 or 198</td>
<td>9</td>
</tr>
<tr>
<td>Pol S 102 or 206 or 222</td>
<td>4-6</td>
</tr>
<tr>
<td>Econ 201 or 102 and 203</td>
<td>6</td>
</tr>
<tr>
<td>Hist Electives¹</td>
<td>3</td>
</tr>
<tr>
<td>Anth 101 or Soc 101</td>
<td>3</td>
</tr>
<tr>
<td>Psych 105 Intro Psych</td>
<td>3</td>
</tr>
<tr>
<td>Phil 201 Elem Logic</td>
<td>3</td>
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<tr>
<td>Hist 110 and 111</td>
<td>3</td>
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<tr>
<td>Psych 105</td>
<td>3</td>
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<td>3</td>
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<tr>
<td>Phil 101</td>
<td>3</td>
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<tr>
<td>Crm J 101</td>
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Junior Year

First Semester

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<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
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<tr>
<td>Hum or Soc S Elective Electives</td>
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Second Semester

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<th>Course</th>
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<tr>
<td>Hum or Soc S Elective Electives</td>
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Senior Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
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<tr>
<td>Hum or Soc S Electives</td>
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</tr>
<tr>
<td>Elective</td>
<td>3</td>
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</table>

Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
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<td>3</td>
</tr>
<tr>
<td>Hum or Soc S Electives</td>
<td>6</td>
</tr>
<tr>
<td>Electives</td>
<td>6</td>
</tr>
</tbody>
</table>

Option II. Prelaw

The Association of American Law Schools recommends that prelaw students develop capacities in "critical understanding of human institutions and values with which the law deals," "comprehension and expression in words," and "creative power in thinking." While no single major provides this ideal preparation for the study of law, a broadly-based undergraduate course of study is recommended. The prelaw option in political science involves a balanced curriculum designed to develop an understanding of political, economic and social institutions and processes, to acquire skills in communications, and to expose students to an interdisciplinary liberal arts education. Additionally, the rigors of the prelaw option help prepare students for the demands of law school study.

The Prelaw Advising Center in the department assists all students interested in law school regardless of their major. Advisers provide information on course work, requirements of law school admission, and the practice of law. Students should contact the center in their sophomore or junior year.

Requirements for graduation include: 21 hours in political science course work, 9 hours in English composition, 3 hours of accounting, 6 hours in philosophy and other humanities, 4 or 6 hours in economics, and 3 hours of speech or argumentation. This totals 46 hours, many of which also meet general university requirements. Twenty-one of these must be earned at WSU.

Before enrolling in this option, it is advisable that students have fulfilled most of the general university requirements and the requirements of the College of Sciences and Arts. It should be noted that accredited law schools generally insist upon a strong g.p.a. for admission.

The following courses are either required (*) or highly recommended.

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Pol S 101 or 198 and 3 hours from 102, 206 or 222</td>
<td>9</td>
</tr>
<tr>
<td>*Engl 101 and 201</td>
<td>9</td>
</tr>
<tr>
<td>*Phil 201</td>
<td>9</td>
</tr>
<tr>
<td>*A course stressing public speaking or argumentation</td>
<td>9</td>
</tr>
<tr>
<td>*Econ 201 or 102 and 203</td>
<td>4</td>
</tr>
<tr>
<td>Hist 110 and 111</td>
<td>4</td>
</tr>
<tr>
<td>Psych 105</td>
<td>3</td>
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<tr>
<td>Anth 101 or Soc 101</td>
<td>3</td>
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<tr>
<td>Phil 101</td>
<td>3</td>
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<td>Crm J 101</td>
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Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pol S 300, 402 and Pol S Electives</td>
<td>9</td>
</tr>
<tr>
<td>*Engl 301</td>
<td>9</td>
</tr>
<tr>
<td>*Acctg 230</td>
<td>9</td>
</tr>
<tr>
<td>Electives, especially from Econ, Hist, Phil, Psych, Soc or Crm</td>
<td>9</td>
</tr>
<tr>
<td>Acctg 231</td>
<td>9</td>
</tr>
<tr>
<td>Other electives, especially Engl grammar and literature</td>
<td>9</td>
</tr>
</tbody>
</table>
Senior Year
*Pol S 404, and/or 593 (with B average), and Pol S electives
*3 hours of Phil or other Humanities elective
Engr 306
Soc 364
SpCom 235, 302 or 324
Statistics
Electives, especially from Engl grammar and literature, Econ, Hist, Phil, Psych, Soc or Crn J

Option III. Public Administration
This program is designed to provide a broad foundation in political science and related subjects on which can be built either a public service career or graduate specialization in public administration.
Within the limits of the basic requirements outlined, special course patterns can be arranged for students particularly interested in such specialties as city management, city planning, and public personnel administration.
Requirements for graduation include 30 hours in Pol S distributed among fields as follows: at least two advanced courses in public administration (including Pol S 440), two in public policy formation, and one in public law (Pol S 300). Also required are Acct 230, Econ 340, a course in statistics (Soc 321, QMeth 215, Math 360, or Psych 311), and Engl 201 or 301.
Appropriate electives include courses in political science, computer science, psychology, sociology, history, economics, and civil engineering.
Before undertaking this schedule of studies, a student should have fulfilled most of the graduation requirements of the College of Sciences and Arts. The following courses, which meet these requirements, are strongly recommended, but not required.

Pol S 101 or 198, and 206
Econ 201 or 102 and 203
Hist Electives
Anth 101 or Soc 101
Psych 105 Intro Psych
Junior Year
First Semester
Pol S 330, 440
Acct 230 Prin Acctg
Electives
Second Semester
Pol S Electives
QMeth 215, Soc 321, Math 361, or
Psych 311
Electives
Senior Year
First Semester
Pol S Electives
Econ 340 Pub Fin Tax
Electives
Second Semester
Pol S Electives
Electives
Option IV. Teaching
This program is designed for those who wish to obtain the Bachelor of Arts in Political Science while also qualifying for the Washington State Provisional Certificate to teach on the secondary level in the field of social studies.
In meeting the graduation requirements for the College of Sciences and Arts, students must include Psych 102, Hist 110, 111. Econ 201 or 102-203 are strongly recommended.
Department requirements:
a. 26 hours in political science, including Pol S 101, 206, 222, 300, 318.
b. A teaching minor in history (18 hours) including Hist 110, 111, 422 and 9 additional hours, at least 3 of which must be upper division. Hist 480, Methods of Teaching Social Studies, is an additional requirement.
c. A second teaching minor, other than in social studies, selected from among those listed in the education section of the catalog. English or speech is strongly recommended.
d. 25 hours in education consisting of Ed/Se 303, 303, 402, 403 or 404, 405 or 406; CoPsy 358 or 359; EdPsy 301. Those who wish to teach both junior and senior high programs must add Ed/Se 450 or 451 to their programs.
e. One course from H Ed 480 or 481.
Students undertaking the above program must add education as a second major, preferably during their sophomore year, but before they enroll in any education courses.

Option V. Public Affairs
Option V provides a program for undergraduates whose career interests require a course background in a specific substantive public policy area, in addition to basic political science training. To accommodate the varying interests of those electing this option, programs are individually tailored in close consultation with the adviser. In the past, students in this option have done work in the following substantive policy areas: urban natural resources, energy, welfare, and environmental. Sample curricula are available from the Option V adviser in the department.
Department requirements:
a. 24 hours in political science, including 101, 206, 416, 440.
b. Econ 102/203 or 201
c. Engl 201 or 301
d. Soc 321 or Psych 311
e. A minimum of 15 hours in the substantive policy are chosen with the approval of the department Option V adviser.

Junior Year
First Semester
Pol S 440 Intro Pub Admin
QMeth 215, Soc 321, Math 360 or
Psych 311
Electives
Second Semester
Pol S Electives
QMeth 215, Soc 321, Math 361, or
Psych 311
Electives
Senior Year
First Semester
Second Semester
Third Semester
Fourth Semester
Preparation for Graduate Study
Students who have had basic undergraduate training in political science while majoring in such subjects as economics, business administration, history, criminal justice, or sociology may be well prepared for graduate study in political science.
Undergraduates who are pursuing their studies at other institutions or through other curricula at this institution and who contemplate graduate work in this department will do well to elect courses similar to those required in the above schedules of studies.

Predental Curriculum
Associate Professor and Coordinator, H. A. Went; Advisers: Professor, L. B. Kirschner; Associate Professors, K. Dunker, R. Foster, K. Kardong, D. King, A. Koch, K. McVor.
Preparation for dental school requires a minimum of two years of college work; however, only a few exceptional students are accepted with the abbreviated background. Three years of college training are strongly recommended, and, where possible, the baccalaureate degree should be secured before attending a professional school. This is the strongly preferred alternative.
Students who complete three years in residence and who have fulfilled all General University Requirements for Graduation may receive the Bachelor of Science degree after one year of satisfactory work in an accredited dental school.

Preadedical Curriculum
Associate Professor and Coordinator, H. A. Went; Advisers: Professor, L. B. Kirschner; Associate Professors, K. Dunker, R. Foster, K. Kardong, D. King, A. Koch, K. McVor.
Preparation for medical school requires a minimum of three years of college work; however, extremely few students are accepted with this abbreviated background. Since there are twice as many applicants nationwide as there are available places in medical schools, preference is usually given to candidates who have attained the baccalaureate degree. The following will meet the minimum requirements of most medical schools:
1. One year of English composition.
2. One year of inorganic chemistry with lab.
3. One year of organic chemistry with lab.
4. One year of college physics with lab.
5. Mathematics through calculus.
6. One year of college biology. Additional courses in zoology and microbiology are recommended.
7. Twenty-one or more hours of electives in the social sciences and humanities.
Department of Psychology

In addition, all premedical students must take the Medical College Admissions Test (MCAT) before applications are made for admission to medical schools.

Most medical schools urge premedical students to secure a broad training in fundamental subjects rather than to anticipate specific subjects that will be repeated in medical school, and place no restrictions on the major area of interest. Approximately 25 percent of the entering medical students have BA degrees, the others BS degrees. The students best prepared for medical school are Zoology majors.

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 or a single composite letter written by the coordinator must strongly support the applicant. The latter is preferable.

Many medical schools welcome applications from students who have majors, or who have taken considerable work, in such diverse areas as humanities, mathematics, psychology, sociology, physics, chemistry, biochemistry, and engineering. Adequate latitude exists in the medical schools' requirements so that the adviser usually is able to suggest a schedule of studies to meet the needs of the individual students. Medical schools also expect a good selection of non-science courses on the student's transcript.

Additional information can be obtained from H. A. Went, 236 Morrill Hall.

Department of Psychology


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 which are related to their respective fields. Also, it is possible to combine a major in psychology with the certificate program in Alcohol Studies or with a minor in Alcohol Studies.

Alcohol Studies offers an interdisciplinary sequence of courses designed to provide a broad knowledge concerning the biology, development, treatment, and prevention of alcohol addiction and abuse. Students work on a baccalaureate degree of their choice while also completing the requirements for either the minor or the certificate in Alcohol Studies.

Up on completion of the academic requirements, students pursuing the certificate in Alcohol Studies must complete an internship in a state approved alcoholism treatment facility (a potential job setting). The internship provides an opportunity for integration and application of knowledge, and acquisition and honing of skills necessary for effective assessment, intervention, and prevention of alcohol addiction and abuse. The graduate program leads to advanced degree for qualified students who plan careers for psychologists. The course of study for the Doctor of Philosophy degree may be directed toward specialization in clinical psychology or in the learning/cognition or biological/sensory areas of experimental psychology. The graduate training program in clinical psychology at Washington State University is accredited by the American Psychological Association.

The department offers courses of study leading to the degrees of Bachelor of Science in Psychology, Master of Science in Psychology, and Doctor of Philosophy.

Excellent facilities are available for instruction and research in psychology. There are specially designed facilities for research in learning, memory, sensory processes, perception, animal behavior, physiological psychology, social interaction, and behavior modification. Departmental facilities also include the Human Relations Center, which is a training clinic. In addition, cooperative arrangements with other units of the university and with outside 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.

**Description of Courses**

For explanation see Index under "Symbols"

**Psychology**

**Psych**

105 [S] Introductory Psychology 3 Contemporary psychology; biological, social, and physical influences on normal and abnormal human behavior. No open to students who have taken Psych 101 or 102.

198 [S] Psychology Honors 3 May substitute for Psych 105 as a prerequisite to lower courses. 1

220 Psychology of Stress 3 Prereq Psych 105. Causes and characteristics of stress; stress prevention and management; psychological aspects of health and illness.

230 Human Sexuality 3 Prereq Psych 105. Sexuality in personal development; personal, cultural, biological influences on sexual identification and behavior; fertility, reproduction, sexual functioning, sexuality and personality.

301 Seminar in Psychology V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq 6 hrs Psych.

306 Industrial/Organizational Psychology 3 Prereq Psych 105. Individual and group goals; organizational structure and theory; leadership, design of jobs; personnel selection and training; engineering psychology.

307 Human Factors 3 Prereq Psych 105 or Engr major. Human limitations and capabilities in architectural and engineering design; system analysis.

311 Elementary Statistics in Psychology 4 Prereq Math 101 or 3 sem high school algebra. Descriptive statistics, probability, and inference; design and interpretation of research.

312 (285) Experiential Medical Psychology 3 (2-3) Prereq Psych 105 and 311. Designing, conducting, and reporting research in selected areas of experimental psychology.

312 Introduction to Personality 3 Prereq Psych 105. Theories, concepts, methods, discoveries in psychology of personality.

314 Psychology of Women 3 Prereq Psych 105. Socialization and sex roles of women; a psychological perspective.

323 Self Control 3 Prereq Psych 105. Analysis of self-control problems; application of behavioral principles to student-conducted projects.

333 Abnormal Psychology 3 Prereq 6 hrs Psych; Psych 321. Problems of abnormality from traditional and evolving points of view; types, therapies, outcomes, preventive techniques.

350 Social Psychology 3 Prereq Psych 105. Attitude changes, conformity, interpersonal attraction, values, groups and social influences explored to construct a coherent viewpoint of social psychology.

352 Aggression 3 Prereq Psych 105. Theories, concepts, and research on the psychology of aggression. Cooperative course taught at the University of Idaho (Psych 1D422).


361 Principles of Development 3 Prereq Psych 105. Major theories of development; contribution of biological and environmental factors; relationship of these factors to child-rearing and social issues.

363 Psychology of Aging 3 Prereq Psych 105; one course in Bio 5. Psychological processes of aging; changes in sensory motor, cognitive motivational and personality characteristics; research methodologies for the study of aging.


366 Treatment Approaches in Alcohol Abuse/Alcoholism 3 Prereq Psych 365. Assessment, case formulation, and treatment plan; different treatment modalities; counseling techniques for alcohol abuse/alcoholism.

372 Introduction to Physiological Psychology 3 Prereq Psych 105; Bio S 102 or 103. Functional relationship between nervous system and behavior; integrated organ systems, sensory processes, and investigative procedures.

384 Psychology of Perception 3 Prereq Psych 105. Perception of size, depth, form, shape; illusions, contrast; historical and modern theories and research; applications and demonstrations.


401 Historical Development of Psychology 3 Prereq 9 hrs Psych or senior standing. Concepts, methods, theories, trends, and systems.


440 Clinical/Community Psychology 3 Prereq 321, 331. Professional problems; theory, training, relations with clients, institutions, public.
444 Basic Helping Skills 2 (0-6) Prereq Psych 6 hrs. Psych. By interview only. Not open to freshmen. Training in basic skills to work with varied types of clients; didactic and role play instruction.

445 Undergraduate Practicum V 1 (0-3) to 3 (0-9) May be repeated for credit; cumulative maximum 6 hours. Prereq 6 hrs Psych. By interview only. Not open to freshmen. Supervised experience in local and county agencies; application of psychological principles to paraprofessional counseling.

464 Psychological Disorders of Children 3 Prereq Psych 105; Psych 361 or CPS 240. Intellectual and emotional disorders of children.

470 Motivation 3 Prereq Psych 105. Different motivational systems; analysis of environmental and biological factors influencing motivation, with emphasis on human motivation.

473 Advanced Physiological Psychology 3 Prereq Psych 372. Neurophysiological, hormonal, and biochemical bases of regulatory behavior; theoretical and applied issues.

490 Cognition and Memory 3 Prereq 6 hrs Psych. Human information processing, memory, and cognition.

494 Advanced Laboratory in Psychology I or 2 Prereq Psych 311, 312. Experimental research in psychology.

497 Instructional Practicum V 1-4 May be repeated for credit, cumulative maximum 4 hours.

498 Research Participation V 1 (0-6) to 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. Prereq 9 hrs Psych including a lab course. By interview only. Participation in the current research of departmental faculty.

499 Special Problems V 1-4 May be repeated for credit.

502 Research Participation V 1 (0-3) to 3 (0-9) May be repeated for credit; cumulative maximum 16 hours. Research design, equipment, data collection, data analysis, and report writing.

504 History of Psychology: Theoretical and Scientific Foundations 3 Roots of scientific explanation in psychology traced through various philosophical schools and psychological movements.

505 Teaching Introductory Psychology 1 May be repeated for credit; cumulative maximum 4 hours. Problems and techniques related to teaching introductory psychology.

507 Topics in Psychology 3 May be repeated for credit.

508 Special Topics in Psychology V 1-3 May be repeated for credit.

511 Advanced Statistics in Psychology 3 Prereq Psych 311. Probability, statistical inference, correlation and regression, multivariate applications; computer analyses.

512 Statistical Inference and Research Design 3 Prereq Psych 511. Psychology statistics used in the design and analysis of experiments.

513 Seminar in Quantitative Methods and Research Design 3 May be repeated for credit. Prereq Psych 511, 512. Advanced topics in specified quantitative procedures and in design of research in psychology.

515 Program Evaluation 3 Prereq Psych 511. Substantive, methodological and political issues in evaluation of local and national human service programs.

520 Theoretical Foundation of Psychotherapy 3 Major therapy systems.

521 Behavior Modification 3 (2-3) Prereq Psych 490, 520. Learning principles applied to modifying behavior of children and adults in institutions, clinics, and schools.

522 Applied Behavioral Research 3 Research theory and methodology on development of research and experimental behaviors.

530 Professional Issues 3 Ethical and philosophical issues faced in the practice of psychology.

533 Psychopathology: Theory and Research 3 Theory and research concerning deviant behavior.

535 Clinical Assessment 3 Interviewing procedures, case formulation, and case presentation.

536 Personality Assessment 3 Theories and methods of personality assessment.

537 Intelligence: Theory and Assessment 3 Theories and methods of appraising intelligence.

540 Group Psychotherapy 3 By interview only. Psychotherapists in the context of the group.

542 Community Psychology 3 Prereq 1 yr graduate work. Community psychological concepts; consultation, training, and research roles for psychologists in community programs. Community project experience required.

543 Clinical Child Psychology 3 Behavior problems, diagnosis and treatment procedures with children.

544 Medical Psychology 3 Psychology in physical health and illness.

545 Clinical Methods 3 (0-9) May be repeated for credit. Prereq Psych 520, 530, 535, 536, 539 or c/. By interview only. Supervised practice in the clinical application of psychology.

546 Advanced Clinical Methods V 1-3 May be repeated for credit; cumulative maximum 12 hours. Prereq Psych 545 or c/. By interview only. Advanced practice in the clinical application of psychology; supervised practical training.

547 Seminar in Clinical Psychology 3 May be repeated for credit. Advanced current topics in clinical psychology.

548 Advanced Social Psychology 3 Theories, findings, and methods in group processes, interpersonal attraction, and personal perception.

551 Personality Dynamics 3 Theories and research in interpersonal dynamics; cognitive, learning, equity and attributional concepts.

553 Personality: Theory and Research 3 Basic concepts and contemporary approaches.

561 Developmental Psychology 3 Theories of development and research methods; emotional, cognitive, moral and adult development; language and sex roles; research in current social problems.

574 Physiological Psychology 3 May be repeated for credit. Neuroanatomical, neurochemical, and other biological bases of human and animal behavior.

575 Somatic Treatment Methods 3 Prereq Psych 533. Clinical aspects of physical medicine from standpoint of impact on and relevance for clinical psychology.

576 Neuropsychological Assessment 3 Brain-behavior relations in humans and the assessment of behavioral changes accompanying cerebral injury.

578 Behavioral Endocrinological 3 Prereq Psych 574. Roles of the neuroendocrine system in normal and abnormal behavior.

579 Behavioral Neurosciences 3 Prereq Psych 574. Advanced topics in neurochemistry, neurophysiology, and neuroanatomy.

584 Sensory Bases of Behavior 3 Prereq Psych 384. Sensory and physiological aspects of vision, audition, and other senses.

585 Psychology of Visual Perception 3 Perception of size, distance, form, contrast, illusions; motivation, personality, information processing.

586 Seminar in Physiological/Sensory Psychology 3 May be repeated for credit. Advanced current topics in physiological/sensory psychology.

591 Models of Learning 3 Historical and current theory and research in learning and cognition.

592 Cognition and Memory 3 Experimental approaches to human information processing, memory, and cognition.

593 Experimental Analysis of Behavior 3 Operant conditioning in relation to the experimental evidence currently available; examination of research strategies.

594 Seminar in Learning/Cognition 3 May be repeated for credit. Advanced current topics in learning/cognition.

595 Clinical Internship in Psychology 16 (5-33) May be repeated for credit. Prereq passing of prelims and completion of course work for PhD. Clinical training in an internship approved by American Psychological Association or by WSU.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Alcohol Studies

AlcSt

365 Problems of Alcohol Addiction and Abuse 3 Same as Psych 365.

366 Treatment Approaches in Alcohol Abuse/Alcoholism 3 Same as Psych 366.

367 Special Topics in Alcoholism 3 May be repeated for credit; cumulative maximum 6 hours. Prereq AlcSt 365, 366. By interview only. Selected current topics in alcoholism and alcohol-related problems.

444 Basic Helping Skills 2 (0-6) Same as Psych 444.

447 The Practice of Alcoholism Counseling 2 Prereq completion of AlcSt minor. By interview only. Rules and regulations governing alcoholism facilities; professional, ethical, and legal issues; work with other professionals, agencies, and the community.

499 Special Problems V 1-4 May be repeated for credit.

Schedule of Studies

At least 40 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

Beyond certain minimum requirements, there is flexibility in the major (or minor) program, in accordance with the needs of the individual student. A person may certify as a major at the end of the freshman year. Students who are considering a psychology degree should, as early as possible in their academic careers, seek consultation.
with a faculty adviser in the Department of Psychology for assistance in planning their individual programs.

The Bachelor of Science in Psychology requires a minimum of 30 credit hours in psychology, at least 15 hours of which must be in upper-division courses. The student must take at least 10 credit hours of psychology in residence at WSU and must maintain at least a C average in psychology courses.

Required Courses
*Psych 105, 311, 312
*Bio S 102, or 103
*Math 107, 171, or 201

Students must meet the graduation requirements of the College of Sciences and Arts.

Recommended Courses
Psych 494, plus one 3-hour course from Psych 445, 497, 498, 499. Psychology electives will be chosen in consultation with adviser.

Numerous electives during the first two years—mathematics, biology, physics, chemistry, literature, history, philosophy, sociology, anthropology—contribute substantially to the study of psychology. Again, consultation with a faculty adviser is recommended prior to selecting either psychology courses or supporting courses in other areas.

Students in the Honors Program and transfer students should ask about modifications in the above schedule for the psychology majors. Students interested in combining a psychology major with the certificate program in Alcohol Studies should inquire at the office of the Department of Psychology.

Minors
Minor in Psychology. The minor in psychology may be certified after the completion of 90 semester hours, at the beginning of the senior year. It requires 18 credit hours in psychology, of which at least 9 must be in upper-division courses.

Required Courses for the Psychology Minor
A. Psych 105.
B. At least one psychology laboratory course (3 hrs in either Psych 445 or Psych 498 may be substituted).
C. Elective courses in psychology, to be chosen in consultation with a psychology faculty adviser.

Teaching Minor in Psychology. For the psychology minor in secondary school teaching, see the Elementary and Secondary Education section of this catalog.

Minor in Alcohol Studies (16 hour minimum). AlcSt 365, 366, Pharm 217; AlcSt/Psych 444 or S W 493; Psych 321 or 333; S W 394 or 494 or Psych 440. Recommended electives: AlcSt 367, 399, Psych 220, 324, 350; Soc 360; S W 190, 393.

*To be completed during the freshman and sophomore years.

Certificate in Alcohol Studies. Students must complete all requirements for the minor in alcohol studies plus AlcSt 447 and S W 490 (10-15 credits).

Preparation for Graduate Study
Students who contemplate work leading to advanced degrees are urged to confer as early as possible with a psychology faculty adviser. Graduate programs in psychology require a solid background in mathematics, natural sciences, physics, philosophy, and social sciences as well as appropriate preparation in psychology itself.

Social Science Courses
For explanation, see Index under "Symbols"

Soc S
110 [H] World Civilizations I, Origins to 1500 S Same as Hum 110.
111 [H] World Civilizations II, 1500 to Present Same as Hum 111.
305 Leadership Development in Agriculture and Home Economics 3 Same as AgHee 305.
404 (433) Current Issues in Agriculture and Home Economics 3 Same as AgHee 404.
405 Public Policy in Agriculture and Home Economics 3 Same as AgHee 405.
444 Rural Development in International Agriculture and Home Economics 3 Same as AgHee 444.

Department of Sociology


Courses in sociology are designed to provide the student with a better understanding of what makes people and groups of people behave the way they do. Sociology studies people from the behavior and interaction of these groups, traces their origin and growth, and analyzes the influence of group activities on individual members. Some knowledge of sociology is generally regarded as a useful supplement to the course work in most fields. The course of study for majors is flexible enough to incorporate a variety of individual interests, such as deviance and criminology, the family, social welfare and social policy, and environmental sociology.

Majors may select one of three options for specialized study: 1. General Sociology, II. Social Research and Data Analysis, or III. Social Welfare and Public Policy. These options are described below. 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 graduate health administration, and counselling.

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.

Description of Courses
For explanation see Index under "Symbols"

Soc
101 [S] Introduction to Sociology 3 Human society and social behavior; effects of groups, organizations, cultures, and institutions. Prereq for all courses except Soc 102, 150, 198, 381.
150 Marital and Sexual Life Styles 3 Traditional and alternative marriage styles; social and personal factors in mate selection; sexual life styles; development of sex roles.
198 [S] Sociology Honors 3
201 Rural Sociology 3 Comparison of rural and urban societies; rural social change and implications for the future.
210 Society and Technology 3 Prereq Soc 101 or 201. Social acceptability and impacts of technological change; societal constraints on technological developments; technological risk assessment; politics of technology.
220 Society and Biology 3 Prereq Soc 101 or Anth 101; Bio S 102. Sociobiological foundations of human social organization; ecological determinants; genes, culture, and society.
230 (330) Communities 3 Organization, function, change, development, and decline of communities; applications emphasizing rural or urban setting.
240 (340) Social Inequality: Privilege and Poverty in America 3 Distribution of income, wealth, and opportunities; causes and consequences of inequality; social classes.
270 Personal Identity and Social Interaction 3 Development of self-concept in social interaction; attitudes, values, beliefs and behaviors; conformity and interpersonal influence.
320 Introduction to Social Research 3 Methods of collecting data; surveys, experiments, field observations; organization and interpretation of data; reading social research.
321 Quantitative Techniques in Sociology I 4 Prereq Soc 320. Levels of measurement; measures of central tendency, dispersion and association; probability, normal curve, statistical inference.
331 [S] 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.
341 Sociology of Religion 3 Effects of religion on everyday life and the major institutions of society; cults and sects.
342 Political Sociology 3 Sociological analysis of political institutions and power structures; social and cultural basis of political behavior.
343 Sociology of Professions and Occupations 3 Relationship between work and social class, alienation, sexism, racism, poverty, disease and death.
351 The Family 3 Prereq Soc 101 or Psych 105. Family system and its interaction patterns; family life cycle from marriage through death; marital relations, divorce, sexuality, parenting crisis, abuse.

1Open only to students in the Honors Program.
355 [SI] Human Values 3 Prereq Soc 101 or Psych 105. Defining and measuring societal and individual values; value conflicts of Americans; moral development and change; impacts on behavior.

356 Sociology of Aging 3 Changes in behavior and social roles due to aging; economics and demographics of aging; social relations of the elderly; retirement and widowhood.

360 Theories of Deviance 3 Theoretical perspectives on deviant behavior; crime, juvenile delinquency, mental illness, suicide, alcohol and drug abuse, sexual deviance; sociological control.

361 Criminology 3 Crime and society; nature, types, and extent of crime; theories of criminality; control of crime.

362 Juvenile Delinquency 3 Sociological perspectives on delinquency; delinquent gangs and subcultures; delinquency causation and control; law and its enforcement: juvenile justice and corrections.

364 Law and Society 3 Prereq Crm J 101 or Soc 601. Social factors in the emergence and operation of law and impact of law on society.

365 Problems of Alcohol Addiction and Abuse 3 Same as Psych 365.

366 Treatment Approaches in Alcohol Abuse/Alcoholism 3 Same as Psych 366.

371 Small Group Analysis 3 Prereq Soc 6 hrs. Interpersonal relations in small groups; influence and social power; stereotypes.

373 Mass Communication and Public Opinion 3 Social history of print and broadcast media; communication and mass media; public opinion, propaganda, censorship, violence, conflict and change.

374 Collective Behavior and Social Movements 3 Sociological basis of panics, riots, fads, and fashions; collective behavior as basis of social change and development of social movements.

381 Sociology of Black Americans 3 Sociological examination of the Black experience in America.

384 Sociological Sex Roles 3 Biological and social causes and effects of sex role socialization; male/female relationships including discriminatory practices, prostitution, and rape.

391 Special Topics in Sociology V 1-3 May be repeated for credit; cumulative maximum 6 hours.

410 Development of Social Theory 3 Prereq 6 hrs Soc. Biographical accounts and original writings of both early sociological masters and contemporary sociologists; history of U.S. sociology in social context.

418 (462) Human Issues in International Development 3 Same as Anth 418.

420 Sociological Methods and Techniques 3 Prereq Soc 320, 321. Introduction to sociological research methods; research procedures; measurement, observation, experimentation, survey methods, sampling, questionnaire construction, analysis.

421 Quantitative Techniques in Sociology II 3 Prereq Soc 320, 321. Probability theory, inference theory, one and two sample tests; simple and multiple regression analysis.


446 Medical Sociology 3 Social factors in health and illness; organization and change in health care; impacts of rising costs and aging.


465 Juvenile Justice and Corrections 3 Same as Crm J 465.

499 Special Problems V 1-4 May be repeated for credit.

510 Theories of Social Organization 3 Major theories of social organization in historical perspective.

512 Theory Construction and Formalization 3 Testing; formalization of theoretical systems; adaptation of general models to specific problems.

517 Seminar in Contemporary Sociological Theory 3 Recent developments in sociological theory, analysis, application and appraisal of specific theoretical systems.

518 (562) Human Issues in International Development 3 Same as Anth 518.

520 Research Methods in Sociology 3 Prereq Soc 420. Methodology of social research at the proper level.

521 Special Topics in Quantitative Techniques III 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Soc 321, 421. Multiple and partial correlation and regression; factor analysis; discriminate analysis; experimental design; categorical variables.

522 Advanced Sociological Methodology 3 May be repeated for credit; cumulative maximum 12 hours. Prereq Soc 421, 521. Scaling theory; sampling theory, experimental design, measurement of association, multivariate analysis, current methods and techniques.

523 Evaluative Research 3 May be repeated for credit. Prereq Soc 520, 521. Methodology of evaluation research of social programs: design, data collection, and analysis; field experience.

524 Sociology and Public Policy 3 Graduate level counterpart of Soc 424; additional requirements. Credit not granted for both Soc 424 and 524.

530 Demography 3 Prereq Soc 420. 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 experience; ecologically-balanced roles; 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.

533 Social Impact Assessment 3 Sociology's contribution to environmental impact assessments; methods, contents, and contexts of assessing social impacts of proposed developments.

542 (432) Energy and Society 3 Energy and societal evolution; energy consumption pattern and quality of life; social impacts of energy shortages and alternative energy systems.

543 (432) Sociology of Religion 3 Role of religion in social structure, process and change; analysis of religious behavior.

545 Sociology of Community 3 Community stability and change: interaction processes; decision-making; social linkages; effects on well-being.

548 Political Sociology 3 Systematic survey of theories and the major research literature in political sociology.

550 Advanced Social Psychology 3 Same as Psych 550.

551 (451) Comparative Family Systems 3 Contributions of comparative research and theory to the understanding of marital, family, and kinship relations and behavior.

552 Practicum in Family Research V 1-4 May be repeated for credit; cumulative maximum 12 hours. Research design, measurement, data collection, analysis, and manuscript writing.

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.

555 Sex Roles in Society 3 Same as Cps 555.

556 Sociology of Aging 3 Theory and methods in social gerontology: effects of age and aging on human behavior and social interaction.

560 Problems of Deviance Theory 3 Development of theories of deviant behavior; new issues in the study of deviance.

561 Sociology of Law 3 Social factors affecting the development and maintenance of legal structures and the processes of administration of justice.

562 Seminar in Deviant Behavior 2 May be repeated for credit.

563 Seminar in Crime and Delinquency 3 Contemporary theory and research in crime and delinquency.

568 Adolescent Alcohol Use and Abuse 3 Contemporary sociological theory and research in adolescent alcohol use and abuse; action programs, emerging issues.

571 Small Group Theory and Research 3 Theory and methods of small group research; types of groups, formation, and development of communication networks; socialization in group situations.

572 Socialization 3 Theories of childhood and adult socialization; personality development; symbolic interaction; learning; agents of socialization.

573 Behavioral Sociology 3 Sociological research and theory dealing with overt behavior of humans in social situations.

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.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Social Welfare and Public Policy

S W 190 Introduction to Social Work 3 Survey of practice: social workers and social service agencies, individual group, and community practice.
The student must complete the requirements specified under the first two years of the General Sociology Option, and should complete Soc 420 during the senior year. In addition the student should complete the following courses: Math 201, 202; Phil 201, 425; Cpt S 151, 370.

Option III. Social Welfare and Public Policy
This option is intended to provide students with appropriate training for employment in areas such as social welfare delivery services, public policy analysis, needs assessment, or social impact assessment. Two illustrative sequences are provided below: sequence one in social welfare and sequence two in public policy. These sequences indicate the breadth considered desirable for employment in these two areas including: (a) general sociology, (b) research methods, (c) content specialization, and (d) field placement in a potential job setting. Other areas of content specialization can be developed by individual students with adviser approval.

SOCIAL WELFARE

The social welfare sequence is designed to educate students for responsible entry into the field of social work and the human services professions. Emphasis is given to the development of a generalist who can function effectively in social service programs such as juvenile and adult corrections, mental health, child welfare, mental retardation, family counseling, geriatrics, community development and social action. Courses stress the development of a broad perspective on social problems and social problem solving to include the study of social policy formation and its impact.

Students must master an extensive body of knowledge from the social and behavioral sciences to gain an understanding of the complex nature of social welfare, the social policy underlying these programs, and the methods of working with individuals, families, groups, and communities. Students must also become familiar with the methods of social research and data analysis. A field placement under professional guidance enables students to integrate their knowledge and develop practical skills.

During the first two years students are encouraged to concentrate on meeting the General University Requirements. In the last two years they are heavily involved in the social welfare curriculum and related areas of study.

**Soils**

J. P. Reganold, Adviser. For instructional staff see Department of Agronomy and Soils.

The program offers courses of study on properties and uses of soils. The undergraduate courses provide background for work in practical soil management, in soil inventory, and in other selected areas, as well as in preparation for advanced study.

The course of study leads to the degrees of Bachelor of Science in Soils, Master of Science in Soils, and Doctor of Philosophy.

**Description of Courses**

For explanation see Index under "Symbols"

**Soils**

201 Soil Science: An Introduction 3 Prereq Chem 102. Chemical, physical, and biological properties of soils; fundamentals of soil formation, soil-water-plant relations, soil ecology, and soil fertility.
301 Soil and Water Conservation and Management 3 Prereq Soils 201. Soil and water conservation; soil erosion, inventory, fertility management, reclamation; environmental quality control.

371 Fundamentals of Remote Sensing 1 Physical basis of remote sensing, characteristics of aerial photographs, reflectance from earth surface features.

374 (372) Forestry Application of Aerial Photography Interpreta- 2 tion 2 (1-3) Fundamentals of remote sensing, aerial photography, photogrammetry applied to forest management.

413 Physics of Soil-Water-Plant Relations 3 (2-3) Prereq Math 107; Soils 201. Theory and measurement of soil water, heat and solutes; managing soil erosion and evapotranspiration; groundwater pollution and computer modeling.

414 Introduction to Environmental Biophysics 2 Prereq Math 107; Soils 201. Physical principles of biological environments, radia- tive energy transfer, turbulent transfer of momentum, heat, and water vapor in the lower atmosphere.

415 Environmental Biophysics Laboratory 1 (0-3) Prereq Soils 414 or c/-. Experimental methods and procedures in environmental measurements; temperature, wind, radiation, and humidity measurements in biological environments.

421 Soil Chemistry 3 Prereq Soils 201. Water quality, salt and pesticide migration, chemistry of soil use and modification, acid and alkaline soils, fertilizer reactions, agricultural pollution.

422 Soil Analysis 3 (1-3) Prereq Soils 421 or 441 or c/-. Chemical characterization of soils for diagnostic purposes.

431 Soil Microbial Ecology 3 Prereq Microbio 101 or 201; Chem 240; Soils 201. Basic aspects and significance of soil flora as related to soil biology, plant growth, and environmental problems.

436 Microbial Physiology 5 (3-6) Prereq Microbio 201. Concepts of microbial physiology; growth, metabolism, regulation, variation, structural-functional relationships.

441 Soil Fertility 3 Prereq Soils 201. Plant nutrient requirements, principles of soil testing and tissue analyses, current fertilizer technology, fertilizer reactions in soils.


472 Remote Sensing of Environment 3 Basic remote sensing applied to inventory of natural resources; use of remote sensing methods in research. Cooperative course taught at the University of Idaho (For ID 472A).


499 Special Problems V 1-4 May be repeated for credit.

501 Seminar 1 May be repeated for credit. Presentation of research information.

502 Advanced Topics in Soils 1 May be repeated for credit; cumulative maximum 4 hours. Prereq Soils 421, 422, 413. 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. By interview only. Soil research techniques; application of modern instrumentation to soil analysis. Joint listing with the University of Idaho (Soils ID510).

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.

513 Advanced Soil Physics 2 Prereq Soils 413. Numerical methods and computer models for water, heat, vapor, and solute transport in soils; measuring spatial and temporal variability. (a/y)

512 Advanced Soil Chemistry 3 Prereq Soils 421; Chem 220 and 222. Chemical properties of soil colloidal system. (a/y) Joint listing with the University of Idaho (Soils ID512).

521 Soil Mineralogy 3 Prereq Chem 217. Structures, properties, and identification of major clay minerals; solution equilibria and clay mineral weathering. (a/y)

527 Soil Organic Matter 2 Prereq Soils 421, 431. Formation, chemical properties, and significance of soil organic fraction. (a/y) Cooperative course taught at the University of Idaho (Soils ID511).

531 Advanced Soil Biochemistry and Microbiology 2 May be repeated for credit; cumulative maximum 4 hours. Prereq Soils 421, 431; BC/BS 364. Biochemical and microbiological processes in soil-water environments; nutrient cycling; nutrient assimilation; soil fertility and advanced techniques.

541 Soil-Plant Relationships in Mineral Nutrition 3 Prereq Soils 421, 441; Bot 320. Nutrient availability in soils; plant responses to soil chemical conditions; soil/root interface with nutrient assimilation and fertilizer efficiency. (a/y)

547 Fertilizer Science 1 or 3 Prereq Soils 441. Manufacture, use, placement, and factors influencing choice of fertilizers. Cooperative course taught at the University of Idaho (Soils ID547).

551 Advanced Soil Genesis 3 Prereq Soils 451. The origin and development of soil; geochemical and biochemical weathering processes; dynamics of organic matter; soil development cycles; influence of environmental factors. (a/y)

557 Advanced Soil Genesis and Classification 3 (2-3) Prereq Soils 451. Genesis, classification and interpretation of soils, including field investigations emphasizing existing interrelationships. (a/y) Cooperative course taught at the University of Idaho (Soils ID551).

573 Advanced Aerial Photointerpretation 2 (1-3) or 3 (1-6) Prereq Soils 371, 374. Flight planning, interpretation of vegetation (diseases and insect infestation), landforms, land use, pollution, temporal changes, photo measurement multispectral sampling. (a/y) Cooperative course taught at the University of Idaho (Soils ID573).

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Schedule of Studies

A Bachelor of Science degree in Soils requires completion of the core requirements plus courses in one of the three areas of specialization: i.e., Soil Management, Soils and Land Use, and Soils Science (General). Each area is designed to meet the specific needs of the individual. At least 40 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

The flexibility of this major makes possible a wide variety of career opportunities as well as thorough preparation for graduate school. Examples of vocational opportunities include soil management positions with agribusiness, commercial farms, and land appraisal firms; soil conservation positions with the state and federal government; and technical positions with universities. In addition, many soil scientists go into some area of public service and international agriculture.

Core Requirements

The courses listed below are required of all soils majors and include fundamental courses in soils, supporting courses in science and mathematics, and courses that fulfill General University Requirements.

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<tr>
<th>General University Requirements</th>
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<tr>
<td>Humanities</td>
<td>6</td>
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<td>Social Sciences</td>
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<td>Communications</td>
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<tr>
<th>Soils Courses</th>
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<td>Soils 201</td>
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<td>Soils 413</td>
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<th>Physical Sciences</th>
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<td>Chem 105</td>
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<td>Phys 101 or 201</td>
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<td>Geol 102</td>
<td>4</td>
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<tr>
<th>Biological Sciences</th>
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<td>Bio S 103</td>
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<td>Bio S 104 or Bot 120</td>
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<td>Bot 320</td>
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<td>Micro 101 or 201</td>
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<td>Cpt S 105 or 150</td>
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<td>Stat 310</td>
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Areas of Specialization

All soils majors must select and complete an area of specialization under one of the following three options:

**Soil Management.** This curriculum deals mainly with methods and practices of utmost importance to crop production. Beyond the core requirements students should complete the following:

1. **Soils Management**
   - Soils 413 and/or 421
   - Soils 451
   - Soils 473
   - Soils 501
   - Soils 503
   - Soils 505
   - Soils 513
   - Soils 515
   - Soils 521
   - Soils 527
   - Soils 531
   - Soils 541
   - Soils 547
   - Soils 551
   - Soils 573
   - Soils 600

2. **Soils and Land Use**
   - Soils 413 and/or 421
   - Soils 451
   - Soils 473
   - Soils 501
   - Soils 503
   - Soils 505
   - Soils 513
   - Soils 515
   - Soils 521
   - Soils 527
   - Soils 531
   - Soils 541
   - Soils 547
   - Soils 551
   - Soils 573
   - Soils 600

3. **Soil Science (General)**
   - Soils 413 and/or 421
   - Soils 451
   - Soils 473
   - Soils 501
   - Soils 503
   - Soils 505
   - Soils 513
   - Soils 515
   - Soils 521
   - Soils 527
   - Soils 531
   - Soils 541
   - Soils 547
   - Soils 551
   - Soils 573
   - Soils 600

155
Department of Speech

Soils 301 3
Soils 431 3
Soils 441 3
Ag M 344 3
Ag Ec Elective 3
Plant Production 3
Plant Protection (2 of the following: Agron 305, Plant 429, Entom 340) 6
Free Electives 20-22

Soils and Land Use. This option is recommended for students desiring knowledge of soils in relation to land-use planning, soil conservation, and sound land use decisions. Beyond the core requirements, students should complete the following:

Soils 301 3
Soils 374 2
Soils 474 3
Ag Ec 210 2
Ag Ec Elective 3
L A 467 5
Bio S 372 4
Free Electives 22-24

Soil Science (General). This option emphasizes the fundamental sciences and is more preparatory than the previous two options for students wanting to pursue graduate study and research in soils. Beyond the core requirements, students should complete the following:

Soils 431 3
Soils 441 3
Chem 220 and 222 or Chem 240 4
Bio S and Plant Science Electives 6
Math, Cpt S, and/or Stat 4-5
Free Electives 23-26

Preparation for Graduate Study

Preparation for graduate study implies 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 soils includes course work outlined under one of the above options plus completion of Phys 102 or 202, Math 171 and, if not specified in the option, Chem 240.

Department of Speech

Professor and Department Chair, R. E. Potter; Professors, J. R. Franks, P. C. Wadeleigh, M. E. Wingate; Associate Professors, G. R. Caldwell, G. D. Chermak, L. J. Harris, C. L. Madison, R. G. Slabaugh; Assistant Professors, L. J. Purman, K. B. Kennedy, W. H. Shephard; Instructors, J. E. Dengerink, L. B. Larrigan, A. W. Skelly, N. D. Thompson.

The Department of Speech offers courses and major sequences in two areas: Communication Disorders and Theatre Arts and Drama. Courses are designed to provide an understanding of the various areas—history, modes of operation, and place in a modern society—as well as a specialized education. Several courses within the department satisfy the General University Requirement in the humanities.

The Communication Disorders program provides academic work on speech disorders and offerings which prepare professional personnel to meet the diagnostic and therapy needs of individuals of all ages evidencing a wide variety of speech, language, learning, and hearing problems.

Students are prepared, as Communication Disorders Specialists (Speech/Language Pathologists) and Audiologists, to provide direct and consultative services in education and/or medical settings. The course of study emphasizes the physiological and psychological process 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 Communication Disorders program is accredited nationally by the Educational Standards and Accreditation Commission of the American Speech-Language-Hearing Association and, on the state level, by the Office of the Superintendent of Public Instruction.

State and national certification requires an MA or its equivalent. Bachelor's level training in Communication Disorders is considered preprofessional.

The Communication Disorders Clinic is the on-campus training facility for the Communication Disorders program. University students may receive free speech/language/audiology services through the Communication Disorders Clinic.

The Theatre Arts and Drama area offers a variety of courses and practical experiences to supply the student with the skills, critical judgment, and historical perspective necessary to attain proficiency in the performance of period and contemporary plays. Students also may explore the uses of plays in educational and recreational settings. Emphasis is placed in any of the following areas of concentration: acting/directing, technical theatre, history, and criticism, and child drama. The University Theatre and Summer Palace are production arms of the Theatre Arts and Drama Area.

The department offers courses of study leading to the degree of Bachelor of Arts in Speech, Master of Arts in Speech, and Master of Arts in the Teaching of Speech. The department also participates in the interdisciplinary program leading to the degree of Doctor of Philosophy (American Studies).

Description of Courses

For explanation see Index under "Symbols"

Communication Disorders

Spe 118 Voice and Diction for Foreign Students 2 May be repeated for credit; cumulative maximum 4 hours. Instruction in production of the sounds and pattern of general American speech.

205 Introduction to Communication Disorders 3-5 Defects of articulation, language, rhythm, and voice as they relate to public school and general populations.

281 Manual Communication for the Deaf 2 Instruction and practical training in sign language for communication with the deaf.

371 Development of Speech and Language in Childhood 3 The normal development of language and speech; introduction to speech and language disorders in children and the role of the non-specialist.

372 Hearing and Hearing Disorders 3 Acoustic and psychoacoustic aspects of normal hearing and the nature and consequences of hearing disorders.

375 Phonetics 2 Acoustic and applied phonetics.

376 Clinical Methods in Articulation 3 Prereq Spe 205; 375. Evaluation and management of articulation disorders of speech; delayed phonological acquisition, dysarthria, and dyspraxia.

377 Anatomy and Physiology of the Speech Mechanism 4 Anatomical and physiological bases of speech production and the pathologies and abnormalities that require the services of a Communication Disorders specialist.

378 Speech Science 2 Prereq Spe 205, 375. Scientific processes involved in and accompanying the speech act.

469 Sign Language II 3 Prereq Spe 281. Sign language systems; vocabulary and skill development in signing and interpreting signs.

471 Introduction to Clinical Practice 2 Prereq Spe 376. Therapy methods and procedures in speech/language pathology audiologystate/federal laws affecting public school therapy.


473 Language and Learning Disability 3 Diagnosis and remediation of language and learning disabilities in individuals manifesting disorders in understanding or using spoken/written language.


475 Clinical Practice V 1 (0-3) to 2 (0-6) May be repeated for credit; cumulative maximum 8 hours. Prereq Spe 376, 471. Practicum in diagnosis and therapy for speech/language and hearing disorders.

477 Audiological Rehabilitation 3 Theories and methods involved in the audiological rehabilitation of the hearing impaired; use and care of hearing aids; counseling techniques.

478 Therapy for Language Delay and Disorders 3 Prereq Spe 371. Assessment and habilitation for the preschool and elementary-age child with language disorders.

480 Diagnosis and Appraisal of Speech Language Disorders 3 Prereq Spe 375, 471, 473. Principles, techniques, and materials involved in exploring the nature of speech and language disorders; planning programs of therapy.

499 Special Problems V 1-4 May be repeated for credit.

501 Research Methods in Speech 3 Theory, methods, and practice of research.

502 Advanced Internship in Communication Disorders V 1-15 May be repeated for credit. Prereq Spe 475 or 579. Advanced practicum in diagnosis of and therapy for communication disorders.

521 Seminar in Speech Pathology and Audiology 3 May be repeated for credit; cumulative maximum 9 hours. Exploration of ideas derived from current writings and research in speech pathology and audiology.

543 Hearing Aids and Advanced Rehabilitative Audiology 3 Prereq Spe 372, 472, 473. Hearing aid technology, evaluation and fitting, counseling in the habilitative/rehabilative process, rehabilitative considerations for the geriatric population.

573 Speech Palate 3 Prereq Spe 205, 377. Speech and voice problems associated with clefts of the lip and palate.

156
Aphasia 3 Prereq Spe 205, 377, 478. Speech and language disabilities associated with brain injury.

Advanced Clinical Practice V 1 (0-3) to 3 (0-9) May be repeated for credit; cumulative maximum 6 hours. Advanced clinical practice in evaluation and treatment of speech, language, and hearing disorders.

Voice Disorders 3 Prereq Spe 205, 377, 378. Functional and organic voice disorders resulting from various etiologies.


Seminar in Professional Issues in Communication Disorders 3 May be repeated for credit; cumulative maximum 9 hours. Contemporary philosophical and professional issues in the field of communication science and disorders.

Seminar in Clinical Supervision 3 (2-3) Identification and practice in techniques of clinical supervision; supervisory conference behavior. (SS)

Developmental Psycholinguistics 3 Prereq Spe 205, 371. The nature of children's language and theories of language and speech development.

Advanced Audiometric Procedures 3 Prereq Spe 472. Behavioral and physiological principles and procedures in audiology for the differential diagnosis of auditory pathologies; considerations for geriatric clients.


Pediatric Audiology 3 Prereq Spe 472. Auditory behavior and pathologies in children; procedures for assessment and application to others who are difficult to test.

Phonological Acquisition and Behavior 3 Prereq Spe 376. Current literature in articulatory development and deviancy; diagnosis and therapy. (a/y)

Special Projects or Independent Study 3-9 Credit.

Master's Research, Thesis, and/or Examination 3 Credit.

Master's Special Problems, Directed Study, and/or Examination Variable credit.

Doctoral Research, Dissertation, and/or Examination Variable credit.

Theatre Arts and Drama

Drama

160 [H] Introduction to Theatre 3 Drama as prepared and presented for the cinema, for television, and for the stage.

163 Beginning Stagecraft 3 (2-3) Basic techniques of scenery construction and painting in the performing arts; practical application with University Theatre productions.

260 Beginning Acting 3 (2-3) Creative process of acting, physical awareness, group improvisation, and work with the partner.

263 Stage Costuming 3 (2-3) Basic costume construction techniques, sewing skills, measurement, patterns, fabrics, draping for the stage.

264 Stage Makeup 2-6 Basic techniques in the design and execution of makeup for the stage and television.

294 Stage Speech 2 (0-6) May be repeated for credit; cumulative maximum 4 hours. Techniques and exercises for development of the actor's voice for the stage; voice production, articulation, and application.

306 Drama in Recreation 3 Prereq major in RLS or by interview. Drama techniques applied to a recreation setting; organizing and leading drama activities, creative drama, drama therapy and theatre.

325 Rural Values in Film and Drama 3 (2-3) Human values inherent in modern agrarian endeavors as depicted in 20th century film and drama.

360 Acting II 3 (2-3) Prereq Drama 260. By interview only. Fundamentals of acting; textual analysis, structuring the role, and character development.

361 Fundamentals of Play Directing 3 (2-3) Prereq Drama 260, 362. Theories of directing; principles of composition, blocking, casting, organization, and rehearsal; scene rehearsals and presentation.

362 Script Analysis 3 For directors, designers, performers. Aristotelian analysis of scripts for stage and film.

363 Lighting for the Theatre 3 (2-3) Design and execution of lighting for the performing arts; instruments, control systems, principles of electricity, optics and color; required practical.

364 Creative Dramatics 3 Not open to students required to take Drama 306. Philosophy and techniques of informal drama; elementary classroom and other uses.

366 [H] Theatre History I: Beginnings to 1700 3 Development of theatre and drama from its beginning to 1700; major trends, plays, playwrights, actors, architecture, scenery, and costumes.

366 [H] Theatre History II: 1700 to 1900 3 Development of theatre and drama from approximately 1700 to 1900; major developments in theatre arts and dramatic literature.

368 Visual Communication in Theatre, Film and Television 3 Analysis of the visual aspects of theatre, film and television applying research in perceptual psychology. (a/y)

396 Theatre Practicum V 1-3 May be repeated for credit; cumulative maximum 10 hours. Supervised backstage work; scenery, costumes, lights, box office and publicity.

418 Topics in Speech 3 Study Abroad (London).

450 Advanced Techniques of Acting 3 May be repeated for credit; cumulative maximum 6 hours. By interview only. Prereq Drama 360. Preparation for performance and individual character study for the advanced student of acting.

460 Play Production with Non-Professionals 3 Acting, directing, design, stage management, and front-of-the-house organization for producers of amateur theatre. Suitable for high school teachers. (a/y)

461 Play Directing II 3 (2-3) Prereq Drama 361, 362. Continuation of Drama 361. Credit not granted for both Drama 461 and 561.

463 Seminar in Theatre Design 3 (0-6) May be repeated for credit; cumulative maximum 9 hours. Visual elements in the performing arts; appropriate for designers, directors, performers; individual drawing skills are taken into account.

464 Topics in Design and Technical Production for Theatre 2 (0-4) May be repeated for credit; cumulative maximum 12 hours. Advanced projects in scenery and properties; costuming, lighting and sound; solving design and technical problems for production.

467 Seminar in Drama 3 May be repeated for credit; cumulative maximum 6 hours. Individualized study and discussion of drama from different eras; sources and treatment, analysis of plays and scripts.

468 Theatre for Children and Youth 3 Theories, dramatic literature and production demands of theatre for children and youth.

490 Internship in Professional Theatre V 10-15 Prereq Drama 163 or 263, 396, 260, 264, 360 or 361, 362, 365 or 366. Off-campus experience with Seattle area professional theatres in all aspects of production excluding performance.

494 Acting: Rehearsal and Performance V 1-3 May be repeated for credit; cumulative maximum 6 hours. By interview only. Practical application of acting techniques during the production of plays.

498 Repertory Theatre 3 May be repeated for credit; cumulative maximum 6 hours. By audition only. Rehearsal and performance and related technical and management work in Summer Palace Repertory Theatre. (SS)

499 Special Problems V 1-4 May be repeated for credit.

541 History of the Theatre 3 Major developments of all aspects of theatre arts from preliterate times to 1650. (a/y)

542 History of the Theatre 3 Major developments of all aspects of theatre arts from 1650 to 1800. (a/y)

561 Play Directing II 3 (2-3) Graduate level counterpart of Drama 461; additional requirements. Credit not granted for both Drama 461 and 561.

565 Seminar in Drama 3 May be repeated for credit; cumulative maximum 6 hours. Seminar in various periods, movements, and phases of drama.

590 Graduate Internship in Professional Theatre V 12-15 Prereq: Spe 501 and completion of one academic year of master's level course work in the theatre arts and drama program at WSU. Internship position at upper level of administration or production that requires expertise in specific area; theories/practical application.

Schedule of Studies

At least 45 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

Area Sequences

1. Communication Disorders

The Communication Disorders program provides preparation for professional (graduate) training as a speech/language pathologist or audiologist. In addition to the courses listed below, an undergraduate major or minor in Communication Disorders (Spe 476 through the Office of Continuing Education and Public Service) is required.


(b) For program options, see Department of Elementary and Secondary Education.
2. Theatre Arts and Drama  
(a) 16 hours of Performance: Drama 260, 264, 294, 360, 361, and 468.  
(b) 18 hours of Dramaturgy: Drama 362, 365, 366, 467, and 6 hours of approved literature electives.  
(c) 12 hours of Design/Technical: Drama 163, 263, 363, and 460 or 368.  
(d) 6 hours of Practicum: 4 hours of Drama 396 or 464; 2 hours of Drama 494.

3. Speech Education Major. See listings under the Department of Elementary and Secondary Education.

Communication Disorders Minor  
A minor in communication disorders requires a minimum of 16 hours including Spe 205, 371, 372 plus 8 hours upper-division courses in communication disorders excluding Spe 475 and 476.

Preparation for Graduate Study  
Students with undergraduate majors in child development, the humanities, education, the social and behavioral sciences, as well as those with undergraduate majors in speech, may be accepted for graduate study in this department.

Program in Statistics  

Statistics is the science that deals with the collection, analysis, display, and interpretation of data. The Program in Statistics offers an interdisciplinary, intercollegiate program that emphasizes the connection of statistics to its many areas of application, as well as the traditional connection to mathematics. The courses in statistics provide training in the application of statistical methods, to the biological, physical, and social sciences, the theory of statistical methods, probability, and statistical computing. Opportunities for individuals trained in statistics abound in business, industry, government and academia.

Faculty in the program collaborate with researchers throughout the entire university community on statistical questions that arise in the researcher's substantive discipline. In addition, faculty carry out active research programs in the discipline of statistics itself.

Description of Courses  
For explanation, see Index under "Symbols"

Stat
310 Agricultural Statistics 3 (2-3) Prereq Math 101. Methods of statistical analysis and the principles involved in their interpretation and application to agricultural data.


412 Biometry 3 Prereq Math 101. Principles and methods of statistical analysis as applied to biological experimentation.

420 Statistical Analysis of Qualitative Data 3 Prereq Math 202, 140, or 172, and a previous course in statistics. Binomial, Poisson, multinomial distribution; contingency tables, Fisher's tests, log-linear models; ordinal data; applications in biology, business, psychology, and sociology. Credit not granted for both Stat 420 and 520.

422 Sampling Methods 2 Prereq Stat 360 or 412. Simple and stratified random sampling; systematic sampling; cluster sampling; double sampling, area sampling. Cooperative course taught at the University of Idaho (ApSt ID422).

430 Statistical Methods in Engineering 4 Prereq Math 172, 220. Random variables, sampling, hypothesis testing; linear, multilinear, and nonlinear regression; analysis of variance for designed experiments; statistical computing. Credit not normally granted for both Stat 430 and 443.

443 Applied Probability 3 Prereq Math 220, 172. Axioms of probability theory; random variables; expectation; generating function; law of large numbers; central limit theorem; Markov chains. Credit not normally granted for Stat 430 and 443. Joint listing with the University of Idaho (ApSt ID451).

444 Introduction to Statistical Theory 3 Prereq Stat 443 or 440. Sampling distributions; hypothesis testing and estimation; maximum likelihood; likelihood ratio tests; theory of least squares; nonparametric methods. Joint listing with the University of Idaho (ApSt ID452).

470 Computer Methods in Probability and Statistics 3 Same as Cpt S 435.

472 Statistical Packages 1 (0-3) May be repeated for credit; cumulative maximum 3 hours. Prereq course in stat methods. No previous computer experience required. Computer techniques for statistical methods; comparison of capabilities of major statistical packages; analysis techniques, graphics, terminal use, data structures, numerical algorithms.

504 Special Topics 3 Prereq Stat 444. Cooperative course taught at the University of Idaho (ApSt ID504).

512 Analysis of Variance and Experimental Design 3 Prereq Stat 412 or 360. Principles of design with analysis and interpretation of data.

514 Nonparametric Statistics 3 Prereq Stat 512. Developmental course in nonparametric methods, including tests, power, efficiency, and ARE. Cooperative course taught at the University of Idaho (ApSt ID514).

516 Time Series 3 Same as QMeth 516.

519 Applied Multivariate Analysis 3 Same as QMeth 519.

520 Statistical Analysis of Qualitative Data 3 Graduate level counterpart of Stat 420; additional requirements. Credit not granted for both Stat 420 and 520.


530 Applied Linear Models 3 Prereq Stat 430 or 412. The design and analysis of experiments by linear models. (a/y)

531 Econometrics 3 Same as Econ 511.

532 Applied Agricultural Econometrics 3 Same as Ag Econ 512.

533 Linear Model Theory 3 Prereq Stat 430 or 443; Math 420. Theoretical basis of linear regression and analysis of variance models; a unified approach based on the generalized inverse. Cooperative course taught at the University of Idaho (ApSt ID533).

535 Regression Analysis 3 Prereq Stat 444 or 430. Conceptual development of regression; estimation, prediction, tests of hypotheses, variable selection, diagnostics, model validation, correlation, and nonlinear regression. Joint listing with the University of Idaho (ApSt ID535).

539 Time Series 3 Prereq Stat 444. Identification and analysis of autoregressive and moving average models; spectral analysis; prediction, inference. Cooperative course taught at the University of Idaho (ApSt ID539).

544 Applied Stochastic Processes 3 Prereq Stat 430 or 443. Poisson and Markov processes; queueing theory; auto-correlation; stationarity; power spectra; harmonic analysis; linear mean-square predictions. Joint listing with the University of Idaho (ApSt ID453/544).

548 Statistical Theory 1 Prereq Math 273; Stat 430 or 443. Probability spaces, combinatorics, multidimensional random variables, characteristic function, special distributions, limit theorems, stochastic processes, order statistics.

549 Statistical Theory II 3 Prereq Stat 548. Continuation of Stat 548. Statistical inferences; estimation and testing hypotheses; regression analysis; sequential analysis and nonparametric methods.

562 Mathematical Genetics 3 Prereq GenCB 301; Stat 430, 443 or 412. Statistical approaches to Mendelian and population genetics; theories and estimation of genetic parameters; testing genetic hypotheses. (a/y)

571 Reliability Theory 3 Prereq Stat 430 or 443. Statistical concepts; stochastic material strengths and lifetimes; strength and safety analysis; reliability and coherent systems; maintenance models; complex systems. (a/y) Joint listing with the University of Idaho (ApSt ID571).

572 Data Analysis 3 Prereq Math 220; Stat 430, 443 or 548. Robust statistical methods resistant to failure of model assumptions; smoothing, curve-fitting; multivariable relationships; clustering.

609 Special Projects or Independent Study Variable credit.

Preparation for Graduate Study  
As preparation for work toward an advanced degree in statistics, a student should have completed one or more of the following: a course in probability and statistical theory, and mathematics through multivariable calculus and an introduction to linear algebra. More important than the above specific courses is an indication of the student's interest and ability in statistics. Virtually all U.S. graduate programs provide adequate opportunity to take prerequisite courses after admission to graduate school.
Interdisciplinary University Courses

Univ

100/101 College Majors and Career Choice 1
Career development and the decision-making process; selection of an academic major; personal assessment and development.

800 Doctoral Research, Dissertation, and/or Examination Variable credit. (For Interdisciplinary PhD only)

College of Veterinary Medicine

The College of Veterinary Medicine offers courses of study leading to the degrees of Doctor of Veterinary Medicine, Bachelor of Science in Veterinary Science, 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.

The following program is an outline of the minimum requirements necessary for application to professional study in the College of Veterinary Medicine. However, only a few exceptional students are accepted with this abbreviated background.

PREVETERINARY REQUIREMENTS Hours

1. Communication Proficiency 6
   (three hours must be in written communications)
2. Arts and Humanities 6
3. Social Sciences 6
4. Intercultural Studies 3

Courses to meet the above requirements must be selected from the list under the General University Requirements for Graduation section of this catalog.

5. Physical and Biological Sciences 36
   Except under unusual circumstances applicants will be expected to have completed courses as indicated in each of the following: chemistry including organic and biochemistry; mathematics, physics including electricity, optics and sound; zoology or general biology; genetics.
6. Electives 3

Totals Hours Required 60

BACHELOR OF SCIENCE DEGREE IN VETERINARY SCIENCE

The Bachelor of Science degree in Veterinary Science combines credits earned in both the preprofessional and professional program. The degree is available only to students who have been admitted to the professional program. This degree was designed to benefit veterinary medical students in obtaining employment, applying for scholarships, and qualifying for graduate-level course enrollments. A minimum of 120 semester hours are required for the degree. The minimum basic requirements are:

   Hours

Social Sciences, Arts and Humanities (not less than 6 hours in each field) 12
Communications Proficiency 6

Intercultural Studies 3
Physical and Biological Sciences and recommended electives 39
60 additional hours of acceptable university credit of which 34 hours must be 300-level or above courses in the professional curriculum of the College of Veterinary Medicine 60

Total semester hours 120

Schedule of Studies

PROFESSIONAL CURRICULUM

The professional curriculum for the Doctor of Veterinary Medicine degree is outlined below. A total of 147 semester hours are required for graduation. All courses required in the professional program are upper-division courses.

First Year

First Semester Hours
V M 401 Gross Anatomy 5
V M 402 Microanatomy 5
V M 516 Reproduction 3
V M 356 Intro Vet Med 2
V M 519 Physiology I 4

Second Semester Hours
V M 402 Gross Anatomy 2
V M 518 Physiology II 5
V M 445 Pathology I 3
V M 430 Immunology 3
V M 517 Microbiology 4
V M 409 Epidemiology 2

Second Year

First Semester Hours
V M 531 Pharmacology I 5
V M 446 Pathology II 6
V M 451 Parasitology 5
V M 432 Bacteriology 4

Second Semester Hours
V M 533 Pharmacology II 4
V M 431 Virology 3
V M 460 Lab Diag 3
V M 463 Small Animal Med I 4
V M 481 Radiology 3
V M 433 Public Health 2

Third Year

First Semester Hours
V M 414 Appid Nutrition 3
V M 461 Large Animal Med I 6
V M 464 Small Animal Med II 5
V M 472 Small Animal Surg 4
V M 457 Clinic Anesthesiology 2

Second Semester Hours
V M 456 Species Med 3
V M 462 Large Animal Med II 6
V M 473 Large Animal Surgery 3
V M 477 Theriogenology 4

Electives

Fourth Year

Ten Blocks Required (34 hours)
1 Small Animal 3
1 Large Animal 3
2 Externships 6
Remaining blocks at choice of individual student
Senior Paper 2
A total of 141 credit hours are required for graduation. All courses listed above plus the completion of a Senior Paper are required for graduation.

Preparation for Graduate Study

Students meeting the requirements of the Graduate School and having the Doctor of Veterinary Medicine degree or a bachelor's degree in allied fields may take work leading to an advanced degree in the College of Veterinary Medicine. Students without the DVM degree will take courses in preclinical fields (anatomy, microbiology, pathogenesis, physiology, parasitology, and pharmacology).

The undergraduate preparation should include two semesters of organic chemistry or one semester of physical chemistry and one semester of physics; one year of general chemistry and one semester of college algebra; one semester of comparative vertebrate anatomy and one semester of physiology.

A combined degree program is available which allows simultaneous pursuit of both DVM and graduate degrees. Admission to the College of Veterinary Medicine and to the Graduate School are prerequisites for entry into the combined degree program.

Department of Veterinary and Comparative Anatomy, Pharmacology, and Physiology


Description of Courses

For explanation see Index under "Symbols"

Anatomy

Y An

308 Functional Anatomy of Domestic Animals 3
(2-3) Prereq Chem 102; Bio S 104. For majors in the College of Agriculture and Home Economics. Macroscopic functional morphology of domestic animals.

413 Advanced Anatomy 3 (1-6) May be repeated for credit; cumulative maximum 6 hours. Prereq V M 402. Macroscopic and gross anatomy of selected organ systems.

499 Special Problems 1-4 May be repeated for credit.

513 Advanced Neuroanatomy 3 (1-6) Advanced gross and microscopic anatomy of the nervous system and organs of special sense. (a/y)

515 Advanced Embryology 3 (1-6) Prereq Zool 320 or V An 405. Gross morphological changes in mammalian development; events leading to abnormal development (congenital malformations). (a/y)

592 Seminar 1 May be repeated for credit.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit. (For MS in veterinary science only.)

800 Doctoral Research, Dissertation, and/or Examination Variable credit. (For PhD in veterinary science only.)
**Department of Veterinary Clinical Medicine and Surgery**


**Description of Courses**

For explanation see Index under "Symbols"

**Veterinary Medicine**

**V M**

409 Epidemiology 2 Prereq 1st year in Vet Med. Epidemiology for the professional veterinary student.


460 Laboratory Immunology 3 (2-3) Prereq 2nd year in Vet Med. Laboratory diagnostic procedures and interpretation.


473 Surgery II 3 (2-3) Prereq V M 472. Large animal surgical techniques.


485 Diseases and Management of Pet and Wild Birds 2 (1-3) Prereq junior in Vet Med. Management and handling, diagnosis and treatment of various disease conditions of pet and wild birds.

521 Clinical Medicine II 4 (4-0) Prereq V M 462. Clinical medicine training in diseases of food animals and horses; clinic rounds and diagnostic procedures.

522 Clinical Surgery II 4 (0-12) Prereq V M 473. Clinical surgery, treatment and care of food animals and horses; clinic rounds; surgery, lameness, and diagnostic procedures.

523 Clinical Service II 4 (0-12) Prereq V M 460. Rotation through pathology, radiology, microbiology, and necropsy.

524 Rural Veterinary Practice II 4 (0-12) Prereq V M 462. Farm calls provide on-the-farm instruction on food animals and horses; theriogenology and herd health instruction.


526 Avian Medicine 4 (0-12) Prereq V M 454. Clinical and diagnostic experiences related to poultry and caged birds provided by rotation through diagnostic laboratory.


560 Small Animal Medicine 4 (0-12) Prereq 4th year in Vet Med. Theory and practice of small animal medicine; hospital rotation in all phases.


562 Small Animal Medicine 4 (0-12) Same as V M 560.

565 Small Animal Surgery 4 (0-12) Prereq 4th year in Vet Med. Surgical cases in clinic, ward round, case discussions by students, seminars by faculty, designed surgical exercises.

566 Small Animal Surgery Elective 4 (0-12) Prereq V M 565. Clinical cases; additional designed surgical exercises.

567 Small Animal Surgery 4 (0-12) Same as V M 565.

570 Equine Medicine and Surgery 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. Prereq 4th year in Vet Med. Clinical surgery, treatment and care of patients; clinic rounds; exercises in surgery, lameness and diagnosis procedures.
Department of Veterinary Microbiology and Pathology


Description of Courses

For explanation see Index under “Symbols”

Veterinary Medicine

V M

430 Veterinary Immunology 3 (2-3) Prerequisite major in Vet Med or graduate student in Vet S. Immunology for the professional veterinary student.

431 Veterinary Virology 3 (2-3) Prerequisite in Vet Med or graduate student in Vet S. Virology for the professional veterinary student.

432 Veterinary Bacteriology 4 (3-3) Prerequisite 2nd year in Vet Med. Bacteria that produce disease in animals.

436 Diseases of Commercial Fowl 3 (1-6) Prerequisite V M 422, 446. Diagnosis, control, and treatment of diseases of domestic fowl.

444 Small Animal Pathology 3 (2-3) Prerequisite V M 446. Pathology of diseases of small pet animals.

445 Pathology II 1 3 (2-3) Prerequisite V M 518. Structural and functional alterations in disease; elementary oncology.

446 Pathology II 6 5 (3-3) Prerequisite V M 445. Principles of system and organ response to disease.

449 Pathology of Large Animal Diseases 3 (2-3) Prerequisite V M 446. Diseases of cattle, horses, swine, and sheep; diagnosis at necropsy.

515 Veterinary Parasitology 5 4 (3-3) Prerequisite 2nd year in Vet. Arthropods, protozoa, and helminths of veterinary importance; their host-parasite relationship and control.

542 Advanced Laboratory Medicine 3 3 (2-3) Prerequisite course in veterinary medicine and pathology.

545 Avian Medicine 4 0 (12) Prerequisite 4th year in Vet Med. Laboratory diagnosis and pathology of avian (pet bird and commercial fowl) diseases.


Veterinary Microbiology

V Mic

433 Veterinary Medicine and Human Health 2 Prerequisite 2nd year in Vet Med. Prepares veterinary students in public health and food hygiene.

435 Disease Concepts for Wildlife Biologists 3 Prerequisite V M 430 or Micro 412. Genetic analysis of the immune response in vertebrates; ontogeny, phylogeny, mechanisms of immune regulation.

439 Special Problems V 1-4 May be repeated for credit.

431 Advanced Immunology and Immunogenetics 3 Prerequisite V M 430 or Micro 412. Genetic analysis of the immune response in vertebrates; ontogeny, phylogeny, mechanisms of immune regulation.

432 Virology (3-3) or Micro 412 and BC/SP 364. Advanced topics in basic virology. (a/2)

433 Viral and Rickettsial Diseases of Animals 3 Prerequisite V M 431. Pathogenesis of viral and rickettsial disease. (a/2)

535 Advanced Readings in Veterinary Microbiology I 1-3 May be repeated for credit. Prerequisite senior in Vet Med or graduate student in Vet S. Supervised reading program which permits publication of intermediate technical difficulty and advanced textbooks.

536 Diagnostic Microbiological Conference 1 (0-3) May be repeated for credit. Prerequisite graduate student in Vet S. Identification of animal pathogens in clinical material.

537 Diagnosis of Viral and Rickettsial Diseases of Domestic Animals 3 (1-6) Prerequisite V M 430, 431, 446. Clinical, pathological, and laboratory diagnosis of viral and rickettsial diseases of domestic animals.

550 Seminar 1 May be repeated for credit.

611 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit. (For MS in veterinary science only.)

800 Doctoral Research, Dissertation, and/or Examination Variable credit. (For PhD in veterinary science only.)
Program in Wildlife Biology


Wildlife biology is the scientific investigation and management of wild animal populations. Wildlife biology has a foundation in areas such as evolution, behavior, ecology, and physiology. Modern wildlife science includes the study of a broad array of vertebrate species, such as waterfowl, game birds, songbirds, raptors, furbers, small mammals, ungulates, reptiles, and amphibians. Wildlife research problems often are identified by federal, state and non-profit agencies including the Washington Department of Game, U. S. Fish and Wildlife Service, U.S. Forest Service, National Park Service, World Wildlife Fund, and National Wildlife Federation. Wildlife management applies ecological knowledge to the development of management plans for manipulating plant and animal populations to achieve specific goals and objectives. As man continues to modify natural ecosystems, wildlife biologists are increasingly charged with understanding how these changes will affect animal populations and developing plans for conservation. Wildlife management also includes "bio-policy," the education of lawmakers and the general public regarding wildlife resources.

The Program in Wildlife Biology is open to undergraduate and graduate students. The Bachelor of Science in Wildlife Biology provides training in basic sciences, such as biology, botany, chemistry, ecology, mathematics, and zoology, as well as specialized topics, such as population dynamics, wildlife nutrition, and habitat management. The Bachelor of Science in Wildlife and Wildland Recreation Management is more interdisciplinary in content yet still requires strong exposure to both sciences. Opportunities exist for undergraduate students to be involved with faculty research activities. The program offers a Master of Science degree in Wildlife Biology that requires both advanced academic training and independent research. A PhD degree with an emphasis in wildlife biology may be obtained through the Department of Zoology. A dynamic aspect of the program is the opportunity to interact with students and professionals through the WSU Student Chapter of the Wildlife Society. Graduates in wildlife biology find competitive employment opportunities with state and federal agencies, environmental consulting and other private firms, and universities.

The Program in Wildlife Biology is centered in the Division of Sciences with cooperating faculty in Zoology, Entomology, Forestry and Range Management, and Veterinary Microbiology and Pathology. Cooperative teaching and research and also exist with the Department of Wildlife Resources at the University of Idaho in nearby Moscow. Faculty in wildlife biology are active in research. Areas of specialization include mammalian and avian ecology, behavioral ecology, theoretical and applied habitat analysis, bioenergetics and ecophysiology, nutritional ecology, quantitative and population ecology, wildlife parasitology and diseases, wildlife management and environmental biology and conservation of natural ecosystems, and wildlife management and recreation. Research is conducted on natural and captive wildlife populations.

Description of Courses

For explanation see Index under "Symbols"

- **WI B**
- **280** Introductory Wildlife Management 3 (2-3) Prereq Bio S 104. An introductory course in the principles of wildlife management.
- **328** Animal Population Dynamics 3 Prereq Bio S 104. Structure and dynamics of animal populations; theoretical and applied aspects of population ecology.
- **400** Wildlife Field Studies I (0-3) Prereq WI B 230. Seven day trip (spring vacation) to observe and discuss wildlife research and management by regional, federal, and state conservation agencies.
- **403** Principles of Public Land Management Planning 3 Same as FRM 403. Credit not granted for both WI B 403 and 503.
- **432** Wildlife Nutrition 3 (2-3) Prereq Org Chem. Nutritional requirements and interactions of wildlife populations. Credit not granted for both WI B 432 and 532.
- **436** Advanced Wildlife Management 4 (3-3) Prereq WI B 435. Management criteria for wild vertebrate populations. Field trip required. Credit not granted for both WI B 436 and 536.
- **499** Special Problems V 1-4 May be repeated for credit.
- **503** Principles of Public Land Management Planning 3 Graduate level counterpart of WI B 403; additional requirements. Credit not granted for both WI B 403 and 503.
- **532** Wildlife Nutrition 3 (2-3) Graduate level counterpart of WI B 432; additional requirements. Credit not granted for both WI B 432 and 532.
- **535** Wildlife Ecology 4 (3-3) Graduate level counterpart of WI B 435; additional requirements. Credit not granted for both WI B 435 and 535.
- **536** Advanced Wildlife Management 4 (3-3) Graduate level counterpart of WI B 436; additional requirements. Credit not granted for both WI B 436 and 536.
- **540** Waterfowl Ecology and Management 3 (2-3) Selected literature on North American waterfowl ecology and management. (a/y)

Schedule of Studies

**WILDLIFE BIOLOGY**

**Freshman Year**

- **First Semester**
  - Bio S 103 Intro Biol 4
  - Math 107 and 108 5
  - Chem 105 Principles 4
  - Engl 101 Composition 3

- **Second Semester**
  - Bio S 104 Intro Biol 4
  - Chem 106 Principles 3
  - Math 140 Math Life Sc 4
  - SpCom 102 or AqHl 205 3

**Sophomore Year**

- **First Semester**
  - GenCB 301 Gen Genetics 4
  - Chem 240 Organic 4
  - Cpt S 150 Prog Den Dev 4
  - Physical Science* 3-4

- **Second Semester**
  - WI B 230 Rew Res Mgt 3
  - WI B 280 Int Wlf Mgt 3
  - Bot 332 System Bot 4
  - Bio S 372 Gen Ecology 4
  - Physical Science* 3-4

**Junior Year**

- **First Semester**
  - WI B 328 Anim Pop Dyn 3
  - Stat 412 Biometry 3
  - Zool-Entom** 3-4
  - Bot 462 Commun Ecol 3

- **Second Semester**
  - WI B 432 Wlf Nutr 3
  - Zool 353 Zoophysiol 3
  - Bot 463 Field Ecol 3
  - Zool 324 Comp Vert An 4
  - Zool-Entom** 3-4

**Senior Year**

- **First Semester**
  - Zool 405 Pr Org Evol 2
  - WI B 435 Wlf Edul 4
  - Zool-Entom** 3-4
  - Ag Ec 201 Econ in Agric 3
Electives for both programs must include the General University and College of Science and Arts Requirements.

The core requirements plus electives meet U.S. Civil Service requirements for wildlife biology, wildlife refuge management, general biology, and zoology. Through judicious use of electives, the student can also meet additional Civil Service requirements for fish biology, range conservation, and soil science.

Minor
A minor in Wildlife Biology requires a total of 20 hours of wildlife courses selected in consultation with a wildlife biology faculty member.

Program in Women Studies

**Director, J. Hockenhull.**

The Program in Women Studies offers an interdisciplinary study of women, with an emphasis on their lives, roles, and contributions. The program is designed to achieve four major objectives:

1. To provide students with a systematic knowledge of the multi-disciplinary scholarship about and by women;
2. To enhance the qualifications of students preparing for careers in business, education, and the helping services;
3. To facilitate the understanding of continuing social change in gender-related activities; and
4. To further university and societal goals of sexual equality.

The program offers a minor in Women Studies. The minor requires a minimum of 16 hours of credit including W St 200, 290, 298, and three of the following courses: W St 324, 355, 384, 402.

**Description of Courses**

For explanation see Index under “Symbols”

<table>
<thead>
<tr>
<th>W St</th>
<th>150</th>
<th>Marital and Sexual Life Styles 3 Same as Soc 150.</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>[S] Introduction to Women Studies 3 Multidisciplinary perspectives on women and their past, present, and potential contributions.</td>
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<tr>
<td>210</td>
<td>Gender in Technology 3 Developing skills for overcoming anxieties about math, computers, and the effects of new technologies on our lifestyles, environment, and psychology.</td>
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<tr>
<td>230</td>
<td>Human Sexuality 3 Same as Psych 230.</td>
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<tr>
<td>247</td>
<td>Human Development II 3 Same as CFS 247.</td>
<td></td>
</tr>
<tr>
<td>290</td>
<td>Women and Work: Choices and Changes 2 New skills for the workplace based on study of historical and psychological factors influencing contemporary attitudes; personal career options assessed.</td>
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<tr>
<td>298</td>
<td>[S] History of Women in American Society 3 Same as Hist 298.</td>
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<tr>
<td>301</td>
<td>Topics in Women Studies 2 or 3 May be repeated for credit; cumulative maximum 6 hours.</td>
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<tr>
<td>305</td>
<td>Gender and Politics 3 Same as Pol S 305.</td>
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<tr>
<td>310</td>
<td>Women Artists 3 Women’s art, historical through contemporary.</td>
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<tr>
<td>315</td>
<td>Women in Management 3 Analysis of women’s historical and contemporary role in American management.</td>
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<tr>
<td>324</td>
<td>Psychology of Women 3 Same as Psych 324.</td>
<td></td>
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<tr>
<td>350</td>
<td>Decision Making in Families 3 Same as CFS 350.</td>
<td></td>
</tr>
</tbody>
</table>

351. The Family 3 Same as Soc 351.  
355. Women Writers 3 Same as Eng 355.  
384. Sociology of Sex Roles 3 Same as Soc 384.  
398. History of Women in the American West 3 Same as Hist 398.  
402. Cross-Cultural Gender and Kinship 3 Same as Anth 402.  
499. Special Problems V 1-4 May be repeated for credit.

**Department of Zoology**


Zoology is the basic science devoted to the study of animals. A good foundation in zoology provides a student with the basis for graduate specialization in a wide range of careers in the biological sciences, from ecology to medical and agricultural research. Modern zoology embraces not only the traditional study of animal diversity, structure and function; it also includes study of cellular and molecular biology on the one hand, and evolutionary and population biology on the other.

The various curricula which lead to the BS degree in Zoology meet the needs of many different types of students. Those who expect to study biology further, for example in graduate school, but are unsure of the special area they wish to pursue, can obtain a useful background in a variety of disciplines ranging from field studies to physiology. The department also offers quality training for students planning to apply to professional schools of medicine, dentistry, and veterinary medicine, especially with its specifically tailored pre-medical/pre-dental curriculum. Such pre-professional training has traditionally been centered in the Department of Zoology, and we are proud of the substantial success graduates have achieved in these areas. The university’s pre-medical and pre-dental advising program is run by Zoology faculty and is located in 236 Morrill Hall.

In addition to these pre-professional programs, the department offers a series of career-oriented options designed to provide a student with distinct, marketable skills after four years of study. The course requirements for these various options are listed below.

In addition to its bachelor degree programs, the department offers both master’s and doctoral degrees, the latter in both Zoology and in Zoophysiology, an area in which our faculty is strong. Other faculty interests are diverse and range from cell biology and cancer research through ultrastructure to evolutionary and population biology as well as traditional studies of the biology, relationships and distribution of vertebrates, especially those of western North America.

There are substantial facilities for graduate study in developmental biology, physiology, behavioral, evolutionary and population biology, field biology, and ecology. Special facilities include the vertebrate collections of the Charles R. Conner Museum, biological preserves at Smoot
Hill (the George E. Hudson Biological Preserve, 760 acres of bunchgrass and ponderosa pine habitat); the Electron Microscopy Center; the Eastlick Vivarium, a large government-approved, professionally staffed facility for maintaining laboratory animals; and local terminals connected to the facilities of the University Computing Center.

Cooperation with many other units on campus enhances research opportunities. Faculty in Wildlife Biology are also associated with the Zoology Department, and cooperation with faculty in such departments as biochemistry, entomology, genetics and cell biology, animal science, and the College of Veterinary Medicine is readily achieved when appropriate.

Description of Courses

For explanation see Index under “Symbols”

Zool

135 Animal Natural History 3 Identification, life history, ecology, and behavior of animals commonly found in the Pacific Northwest.


224 Adaptive Strategies of Animals 3 Prereq Bio S 103. Animal structure, function, behavior, reproduction and life history as viewed from an adaptive perspective.

225 General Zoology Laboratory 1 (0-3) Invertebrate and vertebrate animals; structural features, adaptation, diversity and systematic relationships.

251 Introductory Human Physiology 4 (3-3) Prereq I sem Chem. Basic physiological processes in humans from the cellular to the organismal level.

310 Aquatic Ecology 3 (2-3) Prereq Bio S 104. General ecology of fresh, marine, and brackish waters. (a/y)

315 Gross and Microanatomy 4 (3-3) Prereq I sem Biol S. Gross and microscopic anatomy of the human body.


322 Invertebrate Biology 4 (3-3) Prereq Bio S 104. Symmetry, development and evolution of the invertebrate phyla.

324 Comparative Vertebrate Anatomy 4 (2-6) Prereq Bio S 104. Evolution of vertebrates and their organs; correlation of structural modification with function.

339 [B] Principles of Conservation 3 Prereq Bio S 102, 103, or 101. Conservation of major natural resources through a biological approach; philosophical, economic, and political aspects of important conservation issues.

352 Principles of Zoophysiology 4 (3-3) Prereq Org Chem; Bio S 104. Function and control at the cell-organism level.

353 Principles of Zoophysiology 4 (3-3) Prereq Org Chem; Bio S 104. Function and control at the organ-organismal level with emphasis on mammals, including humans.

390 Special Topics in Research Methods 2 (0-0) Prereq Junior in Zool; Org Chem; Phys. May be repeated for credit; cumulative maximum 4 hours. Laboratory and field experience; research equipment and techniques.

393 Seminar 1 Prereq 16 hrs biology. Training in abstracting and reporting recent and classical research in zoology.

405 Principles of Organic Evolution 2 Prereq GenCB 301. Principles, patterns, processes, and mechanisms of evolution with respect to organized systems. Credit not granted for both Zool 205 and 405.

411 (512) Limnology 3 Prereq Bio S 104; Chem 106; Math 171. Chemical, physical, and biological characteristics of inland waters.

412 Biology and Management of Fishes 3 (2-3) Prereq Bio S 104. Evolution, identification, life history, and management of important fish species. (a/y)

414 Fishery Ecology 2 (1-3) or 3 (2-3) Racial discrimination, migration, and spawning activities of salmonids; environmental stress with reference to fisheries, competition, predation, and pollution. Field trip required. Cooperative course taught at the University of Idaho (Fish ID413).

417 Parasitology 4 (3-3) Prereq Bio S 104. Types of associations, life cycles, control, prevention, and modifications of parasites; examination of parasitic protozoans and helminths.

420 Microanatomy 4 (2-6) Prereq Zool 320. Microscopic analysis of selected cell types, tissue, and organ structure; organization, evolution, and function.


427 Radioactive Trace Techniques 2 (1-3) Use of radiotopes in biological research. Credit not granted for both Zool 427 and 527.


430 Biology of Amphibians and Reptiles 4 (3-3) Prereq Bio S 104. Characteristics, evolution, and systematics; patterns of distribution; adaptive strategies; interactions between humans and amphibians and reptiles.

438 Animal Behavior 3 (2-3) Prereq course in biology. Biological study of animal behavior as viewed from ethological, genetic, developmental, ecological, and evolutionary perspectives.

448 Evolution of Ecology of Populations 3 Prereq Zool 405; Biol Sci 272. Ecological and evolutionary factors influencing the life histories and the population structure and dynamics of plants and animals. Credit not granted for both Zool 448 and 548.

450 Cell Biology 3 Same as GenCB 450.

451 Comparative Vertebrate Reproduction 3 Prereq Bio S 104. Physiology of major events in reproductive cycles of vertebrates, emphasizing mammals. Credit not granted for both Zool 451 and 551. Cooperative course taught at the University of Idaho (Zool ID411).

486 Marine Invertebrate Communities 1 (0-3) Prereq Bio S 104. An extended trip to Friday Harbor Laboratory to gain first-hand experience with several marine habitats. Cooperative course taught at the University of Idaho.

497 Instructional Practicum V 1-4 May be repeated for credit; cumulative maximum 6 hours. Academic traineeship in laboratory teaching and tutoring.

498 Career Experience Internship V 2-4 May be repeated for credit; cumulative maximum 4 hours. By interview only. Experience in work related to specific career option area.

499 Special Problems V 1-4 May be repeated for credit.

505 Generation, Degeneration, Regeneration in the Nervous System 2 Plasticity and specificity of neural connections of invertebrates and vertebrates. (a/y) Cooperative course taught at the University of Idaho (Zool ID501).

507 Transmission Electron Microscopy 4 (2-6) Prereq 1 yr biology; 1 yr Org Chem; 1 yr Phys. By interview only. Techniques of transmission electron microscopy, especially those applicable to biological materials.

510 Invertebrate Ecology 3 (2-3) Prereq Zool 322. Adaptations of invertebrates to their environment. (a/y)

511 Principles of Systematic Biology 3 (2-3) Prereq Bio S 103, 104; 10 additional hrs Zool. Principles, methods, and literature of systematic biology; speciation mechanisms; concepts and problems of species and higher taxa; codes of nomenclature. (a/y)

513 Advanced Fishery Management 3 Compensation as a phenomenon basic to exploitation; yield in numbers and weight; models of yield; stock recruitment functions; economic yield. Field trips required. (a/y) Cooperative course taught at the University of Idaho (Fish ID510).

516 Fish Genetics 2 Same as GenCB 516.

527 Radioactive Tracer Techniques 2 (1-3) Graduate level counterpart of Zool 427; additional requirements. Credit not granted for both Zool 427 and 527.

531 Theoretical Ecology 3 Prereq course in calculus. Theoretical aspects of ecology; population dynamics; stochastic environments; competition; predation; niche theory.

548 Evolutionary Ecology of Populations 3 Graduate level counterpart of Zool 448; additional requirements. Credit not granted for both Zool 448 and 548.

551 Comparative Vertebrate Reproduction 3 Graduate level counterpart of Zool 451; additional requirements. Credit not granted for both Zool 451 and 551. Cooperative course taught at the University of Idaho (Zool ID511).

552 Comparative Physiology I 4 (3-3) Prereq Zool 322, 352, or 353; 8 additional hrs Bio S or Ph S. Adaptations of estuarine, intertidal, estuarine, circulation, and metabolism, in vertebrate and invertebrate animals. (a/y)

553 Comparative Physiology II 4 (3-3) Prereq Zool 322, 352, or 353. The role of neural and endocrine systems in coordinating body functions in vertebrate and invertebrate animals.

555 General and Cellular Physiology 4 (3-3) Prereq Org Chem; Math 171; Phys 102; Bio S 104. Physiochemical mechanisms of cellular functions. (a/y)

557 Advanced Mammalian Physiology 6 (5-3) Prereq BC/BCP 364; Zool 353. Function and control of mammalian organ systems.

560 Environmental Physiology 4 Prereq Zool 353 or A S 440. Physiological modes of adaptation of vertebrates to their temporal and physical environments.

573 Cellular and Molecular Aspects of Development 3 Prereq Zool 320, BC/BCP 364, or GenCB 450. Current biochemical and ultrastructural research in developmental biology. (a/y)

586 Special Projects in Electron Microscopy V 2-0-3 (0-0) May be repeated for credit. By interview only. Practical training in one or more areas of electron microscopy; TEM,
587 Topics in Electron Microscopy 1 May be repeated for credit; cumulative maximum 4 hours.

588 Scientific Writing for Graduate Students 2 Elements of effective communication in journal articles, poster papers, grant proposals, and other forms of scientific writing. (a/y)

589 Advanced Topics in Zoology I 2 May be repeated for credit; cumulative maximum in Zool 589, 590—10 hours. Recent advances in zoology.

590 Advanced Topics in Zoology II 2 May be repeated for credit; cumulative maximum in Zool 589, 590—10 hours. Recent advances in zoology.

592 Advanced Topics in Cell Biology V 1-3 May be repeated for credit; cumulative maximum 10 hours. Same as GenCB 592.

593 Seminar I May be repeated for credit. Prereq 20 hrs Zool. Literature and problems.

597 Teaching Practicum I Zoology laboratory teaching internship.

598 Colloquium I May be repeated for credit.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Schedule of Studies

At least 40 of the total hours required for the bachelor's degree in these programs must be in upper-division courses. A candidate for the bachelor's degree must fulfill the graduation requirements of the College of Sciences and Arts and the general departmental requirements for graduation.

ZOOLOGY OPTION—120 hours

Students interested in preparing for professional (e.g., Pre-Veterinary) or graduate work should follow this option.

Electives, General University and College of Sciences and Arts Requirements 26-30

*BC/BP 364 required for pre-veterinary students; strongly recommended for zoology majors.

PRE-MEDICAL, PRE-DENTAL OPTION—124-127 hours

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Engl 201 or 301 or 402</td>
<td>3</td>
</tr>
<tr>
<td>Chem 105, 106, 107, 340, 341, 342, 343</td>
<td>19</td>
</tr>
<tr>
<td>Physics</td>
<td></td>
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<tr>
<td>Math 107, 108 and 171</td>
<td>9</td>
</tr>
<tr>
<td>Math 172 or Stat 412</td>
<td>3-4</td>
</tr>
<tr>
<td>Cpt S 150 or 203</td>
<td>2-4</td>
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<tr>
<td>Foreign Language—two semesters in one language at the college level or two years in high school or an intensive summer course.</td>
<td>8</td>
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<tr>
<td>Bio S 103 and 104</td>
<td>8</td>
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<tr>
<td>GenCB 301 Gen Genet</td>
<td>4</td>
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<tr>
<td>Zoology including:</td>
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<tr>
<td>Zool 320 Prin An Dev</td>
<td>4</td>
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<tr>
<td>Zool 330 or Bio S 372</td>
<td>3-4</td>
</tr>
<tr>
<td>Zool 322 or 324</td>
<td>4</td>
</tr>
<tr>
<td>Zool 352 or 353 or 450</td>
<td>3-4</td>
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<tr>
<td>Zool 393 Seminar</td>
<td>1</td>
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<tr>
<td>Zool 405 Pr Org Evol</td>
<td>5</td>
</tr>
<tr>
<td>Zool 412, 417, 423, 428, 430, Entom 343, or 448</td>
<td>3-4</td>
</tr>
<tr>
<td>Zoology Electives</td>
<td>7-9</td>
</tr>
</tbody>
</table>

Electives, General University and College of Sciences and Arts Requirements 26-30

CAREER-ORIENTED OPTIONS

The department also offers the bachelor's degree with a concentration in one of four career-oriented options, each designed for specific areas of the job market: biomedical sales, animal supervision, biomedical computation, and microstructure and analytical methods. The core courses listed below are required for all four options; additional requirements are specified under each option.

Core Courses—85-88 hours

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts, Humanities, Social Sciences (including economics)</td>
<td>21</td>
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<tr>
<td>Foreign Language (or 2 yrs in HS)</td>
<td>8</td>
</tr>
<tr>
<td>Engl 101, 402</td>
<td>6</td>
</tr>
<tr>
<td>SpCom 102 Public Spkng</td>
<td>3</td>
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<tr>
<td>Phys 101, 102</td>
<td>8</td>
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<tr>
<td>Chem 105, 106, 107, 240</td>
<td>13</td>
</tr>
<tr>
<td>Math 107, and 171 or 202</td>
<td>6-7</td>
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<tr>
<td>Bio S 103, 104</td>
<td>8</td>
</tr>
<tr>
<td>Zool 224, 225</td>
<td>4</td>
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<tr>
<td>Zool 390 Res Methods</td>
<td>2</td>
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<tr>
<td>Zool 393 Seminar</td>
<td>1</td>
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<tr>
<td>Zool 398 Career Experience</td>
<td>2-4</td>
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<tr>
<td>Zool 499 Sp Problems</td>
<td>3</td>
</tr>
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</table>

1. Biomedical Computation—41-42 hours

<table>
<thead>
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<tbody>
<tr>
<td>Math 172, 220</td>
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<tr>
<td>Cpt S 150, 151, 260, 330, 335, 432 or 435</td>
<td>18</td>
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<tr>
<td>Stat 420 Stat Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Stat 412 Biometry</td>
<td>3</td>
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</table>

2. Microstructure and Analytical Methods—34 hours

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Chem 220, 222</td>
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<tr>
<td>BC/BP 364, 366</td>
<td>4</td>
</tr>
<tr>
<td>Phys 410 Electronics</td>
<td>3</td>
</tr>
<tr>
<td>Zool 320, 322, 324</td>
<td>4</td>
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<tr>
<td>Zool 420 or 450</td>
<td>4</td>
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<tr>
<td>Zool 352 or 353</td>
<td>4</td>
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<tr>
<td>Zool 427 Radio Tr Tech</td>
<td>2</td>
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<tr>
<td>Micro 201 Gen Microbj</td>
<td>5</td>
</tr>
<tr>
<td>GenCB 301 Gen Genetics</td>
<td>4</td>
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</table>

3. Biomedical Sales—39-40 hours

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>Micro 101 Bacteriology</td>
<td>4</td>
</tr>
<tr>
<td>BC/BP 364 Biochem</td>
<td>3</td>
</tr>
<tr>
<td>Phys 410 Electronics</td>
<td>3</td>
</tr>
<tr>
<td>Cpt S 150 Prog Dsn Dev</td>
<td>4</td>
</tr>
<tr>
<td>QMeth 215 Statistics</td>
<td>4</td>
</tr>
<tr>
<td>Mktg 360 Marketing</td>
<td>3</td>
</tr>
<tr>
<td>Mktg 477 Promot Mgt</td>
<td>3</td>
</tr>
<tr>
<td>Phr 311 or 467</td>
<td>3-4</td>
</tr>
<tr>
<td>GenCB 301 Gen Genetics</td>
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<tr>
<td>Zool 315 Gr Mic Anat</td>
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<td>Zool 353 Vertebrate Phys</td>
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4. Animal Supervision—36-37 hours

<table>
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<th>Course</th>
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<tr>
<td>BC/BP 364, 366</td>
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<tr>
<td>Phar 211 Pharmaceut I</td>
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<tr>
<td>Zool 324 Comp Vert An</td>
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<tr>
<td>Zool 353 Vertebrate Phys</td>
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<td>WI B 452 Wif Nutr</td>
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<tr>
<td>Zool 417 Parasitology</td>
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<tr>
<td>Zool 438 An Behav</td>
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</tr>
<tr>
<td>Micro 101 Bacteriology</td>
<td>4</td>
</tr>
<tr>
<td>V M 261 Accid &amp; Dis</td>
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<tr>
<td>A S 350 or GenCB 301</td>
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Minor

Requires a minimum of 16 hours to include Zool 224, 225 and 320 or 322 or 324; 8 additional hours of zoology, 6 of which must be upper-division. Not more than 2 hours of Zool 499 may be included in the 16 hours.
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Index

A
Academic Complaints 24
Academic Deficiency 24
Academic Development Program 5
Academic Regulations 21
Accounting and Business Law 58
Activities Center 3
Administrators Credentials 83
Admission 13
Advance Payment 14
Credit by Examination 14
Expenses 14
Financial Assistance 14
Foreign Student 14
Former Student Returning 14
Freshmen 13
Graduate 31
Limited Enrollment 13
Major, Selection of 14
Persons Age 60 and Over 15
Re-entry Advisory Program 5
Transfer Student 13
Adult and Continuing Education
see Adult and Youth Education
Adult and Youth Education 37
Advertising 75
Advisory Program 14
Aerospace Studies 40
Aging 41
Agribusiness 43
Agricultural Communications 38, 76
Agricultural Economics 41
Agricultural Education 38
Agricultural Engineering 43
Agricultural Mechanization 45
Agriculture and Home Economics,
College of 27
Agriculture and Home Economics, General 37
Agriculture and Liberal Arts 46
Agronomy 46
Alcohol Studies 151
American Studies 47
Animal Sciences 48
Anthropology 50
Apartments 17
Architecture 51
(see also Colleges)
Architectural Studies 54
Construction Management 53
Area Studies 105
Art Museum 6
Art and Humanities, GUR Courses 26
Asia Program 54
Asian/Pacific American Studies 55
Assistantships 52
Astronomy 55
Atmospheric Research 11
Auditing 21

B
Bacteriology and Public Health
see Microbiology
Basic and Applied Energy Research
Institute 11
Basic Medical Sciences 128
Biochemistry and Biophysics 56
Biological Sciences
Courses 109
GUR Courses 26
General Studies 110

Biology, General 109
Biophysics 56
Black Studies 57
Board and Room 14, 17
Botany 57
Broadcasting 75
Business Administration 58
Business and Economics, College of 28
Business, Departments of 58
Business Law 58

C
Campus 1
Cancellation of Enrollment 21
Career Services and Placement Center 5
Certificates 87
Certification of Major 14, 22
Decertification 24
Chemical Engineering 63
Chemical Physics 64
Chemistry 65
Chicago Studies 67
Child and Family Studies 67
Child Care 5
Chinese 103
Civil and Environmental Engineering 69
Classical Studies 110
Classics 103
Classification of Students 21
Clothing, Interior Design and Textiles 72
Clubs 3
Colleges
Agriculture and Home Economics 27
Business and Economics 28
Education 29
Engineering and Architecture 30
Pharmacy 33
Sciences and Arts 34
Veterinary Medicine 35
Communication Disorders 156
Communication Disorders Clinic 5
Communication Proficiency, GUR Courses 26
Communications 74
Community Service 9
Comparative American Cultures 77
Compston Union Building 3
Computer Engineering 84
Computer Science 77
Computing Service Center 11
Concerts 7
Conferences and Institutes 9
Construction Management 53
Continuing and Vocational Education 38
Continuing Education and Public Service 9
Correspondence Courses 9
Counseling Psychology 79
Counseling Services 5
Courses
Numbering System 22
Prerequisites 22
Repeat 23
Courses and Curricula 37
Credentials, Administrators 83
Credit 21
by Examination 14
Repeat 23
Credit Hour
Definition of 21
Enrollment Limit 21
Credit Hour Requirements 21

D
Danish 105
Decertification 24
Deficiency, Academic 24
Degree Requirements
Catalog Options 25
Graduate 32
Undergraduate 25
Degrees 1
Institutional Responsibility 25
Departmental Requirements
(see department or college)
Departments and Programs 37
Dietetics 99
Disabled Student Services 5, 15
Dormitories 17
Drama 157

E
Economic Sciences Research Center 12
Economics 81
Education, College of 29
Educational Administration and Supervision 83
Educational Psychology 79
Electrical and Computer Engineering 84
Electron Microscopy Center 11
Elementary and Secondary Education 87
Energy Research Institute 11
Engineering and Architecture, College of 30
Engineering Management 92
Engineering Science 30
English 92
Enrollment
Cancellation of 21
Full Time, 19, 21
Limited Hours 21
Limited Programs 13, 22
Entomology 94
Environmental Engineering 69
Environmental Research Center 11
Environmental Science 95
Examination, Credit by 14
Expenses, Estimated Yearly 14

F
Family Student Housing 17
Fashion Merchandising 73
Fees 19
Advanced Payment 14
Law Enforcement/Firefighters 15
Persons Age 60 and Over 15
Refund Policy 20
Staff/Faculty Fee Waiver 15
Transcripts 23
Fellowships 32
Field Trip Guidelines 22
Finance 58
Financial Assistance 14

201
Index

Fine Arts 97
Food Science and Human Nutrition 99
Footnotes and Symbols 37
Foreign Languages and Literatures 102
Area Studies 105
Intensive Courses 105
Foreign Student Admission 14
Foreign Study 10, 98
Forestry and Range Management 105
Former Students Returning 14
French 103
Freshman Admission Requirements 13
Full Time Enrollment 19, 21

G
General Agriculture
see Adult and Youth Education
General Biology 109
General Home Economics
see Adult and Youth Education
General Studies 110
Biological, Mathematical, and Physical Sciences
Classical Studies
Humanities and Social Sciences
Liberal Arts
Linguistics
Religious Studies
Teacher Training
General University Requirement for Graduation 25
Genetics and Cell Biology 111
Geological Engineering 112
Geology 112
German 103
Grade Points 23
Grade Reports 23
Grading System 22
Graduate Pass-Fail Option 24
Graduate School 31
Graduate Study
Richland 36
Vancouver 36
by Seniors 32
Graduation Requirements 25
College of Sciences and Arts 26

H
Health Education 142
Health Services 6
Herbariums 6
Hindi 104
History 114
History of the Institution 1
Home Economics, College of Agriculture and 27
Home Economics Education
see Adult and Youth Education
Honorary 3
Honors 24
Honors Program 9, 117
Horticulture 118
Hospital 6
Hotel and Restaurant Administration 121
Seattle Center 121
Hour, Definition of 21
Housing 17
Human Nutrition
see Food Science
Humanities
Courses 122
General Studies 110
Humanities and Arts, GUR Courses 26

I
Identification Card 21
Insurance Courses 38
Insurance, Hospitalization 6
Integrated Pest Management 38
Intensive American Language Center 9
Intercollegiate Center for Nursing Education 33, 134
Intercultural Studies, GUR Courses 26
Interdisciplinary Courses 159
International Business 60
International Education 9
Exchange Awards
Study Abroad
International Marketing Program 11
International Service 40
Internships 5
Italian 104

J
Japanese 104
Journalism 76

L
Landscape Architecture 120
Language Center 9
Liberal Arts 110
Libraries 1
Linguistics 110
Literary Studies 122
Living Facilities 17
Loans 14
Deferment 21

M
Major
Certification of 22
Second Major 22
Selection of 14
Teaching Major 90
Management and Systems 58
Marketing 58
Materials Science and Engineering 125
Mathematics 123
Mechanical Engineering 125
Medical Sciences 128
Metallurgy 125
Microbiology 129
Military Science 130
Minor, Departmental 22
Teaching Minor 90
Mission of the University 1
Museums and Collections 6
Music 130
Concerts 7

N
Native American Studies 133
Naval Science 133
Nonresident Fees 19
Nuclear Radiation Center 11
Numbering Systems of Courses 22
Nursing 134
Spokane Center 33
Nutrition 99, 136

O
Observatory 6

P
Pass-Fail 23
Pest Management
see Adult and Youth Education
Pharmacology/Toxicology 137
Pharmacy, College of 33, 138
Philosophy 139
Physical Education 139
Physical Metallurgy 125
Physical Sciences
General Studies 110
GUR Courses 26
Physics 143
Placement Center 5
Planetarium 6
Plant Pathology 144
Plant Physiology 145
Political Science 146
Prental Curriculum 149
Prelaw 148
Preliminary 14
Premedical Curriculum 149
Pre-Physical Therapy 110
Prerequisites 22
Preventive Medicine 159
Professional Experience Program 5
Psychology 150
Public Relations 76
Pure and Applied Mathematics 123

Q
Quantitative Methods 61

R
Radio-Television Services 7
Range Management 105
Real Estate 61
Records, Student Access to 24
Recreation and Leisure Studies 140
Recreational Facilities 3
Re-entry Advisory Program 5
Refund Policy 20
Regional Planning 96
Registration 21
Fees 19
Regulations, General 21
Religious Studies 111
Repetition Credit 23
Repetition of Courses 23
Residence Halls 17
Resident Status 20
Retention 13
Richland, Tri-Cities University Center 36
Room and Board 14, 17
ROTC 40, 130, 133
Russian 104

S
Scholarships 14, 32
Scholastic Societies 3
Science Supportive Services 6
Sciences and Arts, College of 34
Graduation Requirements 26
Sciences, GUR Courses 26
Semester Hour 21
Social and Economic Sciences
Research Center 12
Social Sciences
Courses 152
GUR courses 26
General Studies 110
Social Studies 117
Social Work 153
Sociology 152
Soils 154
Southwest Washington Joint Center 36
Spanish 104
Special Education 79

202
Swedish 105
Symbols and Footnotes 37
T
Teaching Certificates 87
Teaching Majors and Minors 90
Television Services 7
Theatre 7
Theatre Arts and Drama 157
Transcripts 23
Transfer Student Admission 13
also see departments
Tri-Cities University Center 36
Tuition 19
U
University Honors Program 9, 117
Veterans Benefits 15, 21
Vietnam Veterans Fees 19
Veterinary and Comparative Anatomy,
ACADEMIC AND CAMPUS FACILITIES

Admin Annex C-4
Albrook Lab A-4
Anthr Lab B-5
Avery C-3

Bailey Field F-1
Beef Barn G-4
Bohler Gym D-3
Bookstore C-3
Bryan C-3
Bustad E-5

Carpenter B-4
Carver Poultry Farm F-5
Central Stores F-5
Chem Engr B-4
Clark F-3

Cleveland B-5
Coliseum E-1
College C-4

Commens B-5
Comptee Union (CUB) D-3
Computing Center D-3
Controlled Environ Labs G-4

Daggy B-4
Dana A-4

Eastlick B-4
Electrical/Mechanical Engineering A-4
Engr Lab A-4
Entomology G-4

Farmway Play Field F-4
Farrowing Barn H-3
Feed Plant H-5
Fieldhouse Hollingbery D-1
Fine Arts D-4
Fire Dept (Safety) D-4
Fed Services I-4
French Administration E-4
Fulmer C-4

General Storage I-5
Golf Clubhouse G-1
Heald B-4
Heritage House C-5
Hitchcock Res Track G-6
Holland Library C-3
Hollingbery Fieldhouse D-1
Hospital Memorial B-5
Hubert Hall F-3

Intramural Play Field D-3
Jewett Observatory G-5
Johnson Hall E-3
Johnson Tower D-4
Kimbrough C-3

Martin Stadium D-3
McCooksley Services I-4
McCoy E-5
Meats Lab G-3
Memorial Hospital B-5
Mooberry Track D-1
Morfill B-4
Motor Pool H-4
Murrow Comm Center C-4

Owen Sci & Engr Lib C-5

Perf Arts Coliseum E-1
Phys Ed C-3
Phys Sci D-5
Police Dept (Safety) D-4
Power Plant A-4
President's Home A-3
Publications H-4

Reservoir F-5
Rotunda C-6
Safety Bldg D-4
Science C-4
Seedhouse G-4
Sheep Center I-3
Slan A-4
Smith Agr Engr F-4
Smith Gym C-3
Spillman F-4
Stock Judg Pav F-4

Student Health Center (Memorial Hosp) B-5
Swine Center I-3
Swine Lab I-3

Tennis Courts E-3
Thompson B-3
Todd C-4
Troy D-4

Van Doren C-3
Veterinary Clinic D-5

Wegner D-5
White B-3
Wilson D-4
Women's Play Field C-2
Wood Engr Lab A-4

Davis B-3
Duncan Dunn B-3

East Fairway H-1
Gannon D-5
Goldsworthy C-5
Grad Living Center D-6

Kamik E-1
Kruge C-6

McAllister C-6
McCroskey B-3
Nell C-5
Nez Perce F-1

Observatory Court E-5
Orton C-6
Perham D-1

Regents C-2
Rogers C-6

Scott C-2
Stephens B-6
Steptoe E-1
Stevens B-3
Stimson C-5
Streit D-1

Terrace E-1

Valley Crest H-2

Waller C-5
Wilmer B-3

UNIVERSITY HOUSING

Chief Joseph E-1
Chinook D-6
Columbia E-6
Coman C-2
Community B-3
1987-88 CATALOG SUPPLEMENT

The following is a composite list which includes curricular changes approved since the publication of the 1987-89 Catalog. New and dropped courses are identified under the course number; other courses have changes such as number, title, credit, prerequisites, or description.

SYMBOL KEY

new  the word "new" printed directly under the course number indicates the course was approved since publication of the current catalog.

drop  the word "drop" printed directly under the course number indicates the course has been dropped.

210 (101)  changes in course number will appear with the new number listed first and the old number following in parentheses.

3  the number following the course indicates the course is offered for variable credit within a semester.

(2-3)  the numbers in parentheses following the credit indicate the lecture, laboratory, or studio hours required each week.

(u/y)  course is taught alternate years.

(SS)  course is taught summers only.

c//  concurrent enrollment.

V 1-4  the letter "V" preceding the credit indicates the course is offered for variable credit within a semester.

DESCRIPTION OF COURSES/CURRICULA

Accounting
Acctg
696 DOCTORAL TOPICS 3 May be repeated for credit; cumulative maximum 9 hours. Advanced topics in accounting.

Agricultural Economics
Ag Ec
552 (new) AGRICULTURAL PRODUCT DEMAND AND CONSUMPTION ANALYSIS 3 Prereq Econ 501. Advanced economic theories of demand and consumption with applications to food demands. (a/y)

Agricultural Engineering
Ag E
211 PROCESS SIMULATION 3 new Same as Ch E 211.
310 (451) SEMINAR 1 May be repeated for credit; cumulative maximum 2 hours. Prereq junior or senior. Readings and interviews, research, and oral presentation of professional subjects.
354 AGRICULTURAL ENGINEERING ANALYSIS 3 drop
362 AGRICULTURAL POWER AND MACHINERY 4 (3-3) Prereq M E 501 or c/o. Performance, operation, and testing of agricultural power units and machinery; functional requirements, materials, forces and safety. Joint listing with the University of Idaho (AgE ID372).
420 (new) GLOBAL AGRICULTURAL ENGINEERING 1 May be repeated for credit; cumulative maximum 4 hours. Soil and water engineering and harvesting, handling, and storage of agricultural commodities in a global setting. Credit not granted for both Ag E 420 and 520. S, F grading.
441 (new) PROCESS CONTROL 3 Same as Ch E 441.
471 FARM STRUCTURES DESIGN drop 3
520 (new) GLOBAL AGRICULTURAL ENGINEERING 1 May be repeated for credit; cumulative maximum 4 hours. Graduate level counterpart of Ag E420; additional requirements. Credit not granted for both Ag E 420 and 520. S, F grading.

Agricultural Mechanization
Ag M
112 ENGINEERING APPLICATIONS IN AGRICULTURE 3 Engineering principles applied to farm machinery, buildings, processing, irrigation, and ener-

Agriculture and Home Economics
AgHE
451 new SEMINAR 1 (was dual listing)
497 AGRICULTURE/HOME ECONOMICS INTERNSHIP V 2-12 May be repeated for credit; cumulative maximum 12 hours. Off-campus professional experience in agriculture and home economics industries.

Agronomy
Agron
515 SEMINAR IN PLANT PHYSIOLOGY 1 May be repeated for credit. Presentation of recent research in plant physiology.

Alcohol Studies
AlcSt
447 THE PRACTICE OF ALCOHOLISM COUNSELING 2 Prereq completion of AlcSt minor. By interview only. Assessment; therapeutic interventions; record keeping/report writing; regulations governing alcoholism facilities; professional, legal, ethical, legal issues; professional, agency, and community relations.

Animal Sciences
A S
164 POULTRY MANAGEMENT drop LABORATORY 1 (0-3)
166 HORSE MANAGEMENT drop LABORATORY 1 (0-3)
266 HORSES AND HORSEMANSHIP 3 (2-3)
380 SEMINAR 1 May be repeated for credit. For juniors. (from S, F to regular letter grading)
414 VETERINARY CLINICAL NUTRITION 3 Prereq 3rd year in Vet Med. Large and small animal nutrition; nutrient composition, nutritional diseases, and practical feeding methods.
512 VITAMINS 2 drop
513 MINERAL AND VITAMIN METABOLISM 4 Prereq A S 404 or 410: BC/BP 364. Absorption, excretion, metabolism, dietary requirements and interactions of mineral and vitamins in animals and humans. (w/l)
518 MINERAL METABOLISM 3 drop

Analytic Chemistry
Chem
201 CHEMICAL PROCESS PRINCIPLES AND CALCULATIONS 3 Prereq Chem 106; Math 172. Fundamental concepts of chemical engineering, problem-solving techniques and applications in stoichiometry, material and energy balances, and phase equilibria.
211 PROCESS SIMULATION 3 new Prereq Ch E 201; c/o in Math 315. Computer solutions to problems in chemical engineering processing.
310 INTRODUCTION TO TRANSPORT PROCESSES 3 Prereq Ch E 201 or c/o; Math 315. Fundamentals of the phenomena governing the transport of momentum, energy, and mass.
330 UNIT OPERATIONS I 4 drop
331 UNIT OPERATIONS II 4
drop
332 UNIT OPERATIONS 3 Prereq Ch E 201 or c/o; Ch E 310 or c/o. Design calculations, operations, and evaluation of equipment used in fluid flow, heat transfer, and evaporation.

549 ENDOCRINE PHYSIOLOGY drop LABORATORY 1 (0-3)
Animal Sciences — delete "Horses" option.

Anthropology
Anth
203 [S] RELIGION IN CULTURE 3 drop
309 RELIGION, MAGIC, AND MYTH 3 Prereq Anth 101; Soc 101 or Psych 105. Religions of non-literate peoples of the world, Eastern, literate religions, especially Hinduism, relationships between religion, society, and culture.

Asia Program
Asia
272 INTRODUCTION TO MIDDLE EASTERN HISTORY 3 Same as Hist 272.
273 FOUNDATIONS OF ISLAMIC CIVILIZATION 3 Same as Hist 273.
472 THE TWENTIETH CENTURY MIDDLE EAST 3 Same as Hist 472.

Botany
Bot
515 SEMINAR IN PLANT PHYSIOLOGY 1 May be repeated for credit. Same as Agron 515.

Chemical Engineering
Ch E
201 CHEMICAL PROCESS PRINCIPLES AND CALCULATIONS 3 Prereq Chem 106; Math 172. Fundamental concepts of chemical engineering, problem-solving techniques and applications in stoichiometry, material and energy balances, and phase equilibria.
211 PROCESS SIMULATION 3 new Prereq Ch E 201; c/o in Math 315. Computer solutions to problems in chemical engineering processing.
310 INTRODUCTION TO TRANSPORT PROCESSES 3 Prereq Ch E 201 or c/o; Math 315. Fundamentals of the phenomena governing the transport of momentum, energy, and mass.
330 UNIT OPERATIONS I 4 drop
331 UNIT OPERATIONS II 4
drop
332 UNIT OPERATIONS 3 Prereq Ch E 201 or c/o; Ch E 310 or c/o. Design calculations, operations, and evaluation of equipment used in fluid flow, heat transfer, and evaporation.

SPPRING 1988
405 CHEMICAL ENGINEERING
PRINCIPLES 3

406 INDUSTRIAL CHEMICAL
PROCESSES 3

412 CHEMICAL PROCESS
SIMULATION 1

413 drop

414 CHEMICAL PROCESS
SIMULATION III 1

430 CHEMICAL ENGINEERING
SEPARATIONS 3 Prereq Ch E
310. Design and evaluation of
equipment used in distillation,
extraction, absorption, and adsorp-
tion.

476 BIOMEDICAL ENGINEERING
PRINCIPLES 3 Prereq Ch E
301, 310. The application of
chemical engineering principles
to biological processes in the
human body.

571 (557) ADVANCED PLANT DESIGN V
2-3 Design of process plants for
optimum cost and economic
return; scale-up of pilot plants;
Cooperative course taught at
the University of Idaho (ChE
ID571).

Chemistry
Chem

230 COMPUTER SKILLS FOR
SCIENCE STUDENTS 2 Prereq
science lab course. Principles
and practice of computer tech-
nologies for controlling scientific
experiments, analyzing data,
solving problems, and writing
reports.

Civil Engineering
C E

299 CIVIL ENGINEERING SYS-
TEMS 3

317 GEOTECHNICAL ENGINEER-
ING I 4 (3-3) Prereq Geol 102;
C E 314 or chl. Structure, index
properties and classification of
soils: compaction; effective
stress; seepage; consolidation
and shear strength.

330 MECHANICS OF STRUC-
TURE II: Prereq Cpt S 203;
Math 220; C E 314. Analysis of
statically determinate and in-
determinate structures; deflec-
tions; influence lines and
moving loads: Introduction to
matrix analysis.

417 GEOTECHNICAL ENGINEER-
ING III

425 SOIL AND SITE IMPROVE-
MENT 3 Compaction theory
and methods; deep densifica-
tion of soils; advanced con-
solidation theory, proloading,
vertical drains, chemical
stabilization; grouting. Credit
not granted for both C E 425 and
525.

433 REINFORCED CONCRETE
DESIGN 4 (3-3) Prereq C E
350. Loads; dead, live, wind,
earthquake; design of rein-
forced concrete structures: ACI
strength design; design and
testing of concrete mixes.

460 INTERMEDIATE HYDROLOGY
3

460 ADVANCED HYDROLOGY 3
Prereq C E 351. Components
of the hydrologic cycle; concep-
tual models; watershed charac-
teristics; probability/statistics in
data analysis; hydrographs;
computer models; and design
applications. Credit not granted
for both C E 460 and 560.

465 SYSTEMS APPROACH TO
DESIGN 3 Systems approach
to design, project scheduling,
problem modeling, optimization,
decision making, civil engineer-
ing applications.

506 AIR POLLUTION CONTROL
ENGINEERING 3 Prereq senior
in Engr or Ph S. Measurement
and control of air pollution:
environment design calculations;
equipment and process. (u/y)
Joint listing with the University
of Idaho (ChE ID475/675).

525 SOIL AND SITE IMPROVE-
MENT 3 Graduate level
cohort of C E 425: addi-
tional requirements. Credit
not granted for both C E 425 and
525.

560 ADVANCED TOPICS IN
HYDROLOGY V 1-3

560 ADVANCED HYDROLOGY 3.
new Graduate level cohornt
of C E 446: additional require-
ments. Credit not granted
for both C E 460 and 560.

Counselling Psychology
CoPay

513 CAREER DEVELOPMENT 4
Theories, concepts, methods,
and findings in career develop-
ment, vocational assessment
and prediction, career counsel-
ing interventions and outcomes.

534 STUDY SKILLS AND CON-
TENT AREA INSTRUCTION 2
or 3 Same as El/Se 534. (SS)

Criminal Justice
Crm J

490 CRIMINAL JUSTICE INTER-
SHIP V 3-12 May be repeated
for credit; cumulative maximum
12 hours. Prereq major in
Crm J. By interview only. Off-
campus professional internship
in selected criminal justice
agencies.

Drama

490 INTERNSHIP IN PROFESSIONAL
THEATRE V 2-15 Prereq Drama
163 or 165, 260, 264, 260 or
361, 362, 565 or 366. Off-
campus experience with Seattle
area professional theatres in all
aspects of production excluding
performing.

501 RESEARCH METHODS 3
new Theory, methods, and prac-
tice of research.

504 INSTRUCTIONAL PRACTICUM
1 May be repeated for credit;
cumulative maximum 4 hours.

590 GRADUATE INTERNSHIP IN
PROFESSIONAL THEATRE V
2-15 Prereq Spe 501 and com-
pletion of one academic year of
master's level course work in
Theatre Arts and Drama
program at WSU. Internship
positions at upper levels of ad-
ministration or production that
requires expertise in specific
area; theories/practical applica-
tion.

Educational Psychology
EdPay

508 EDUCATIONAL STATISTICS 3
Descriptive statistics: central
tendency, variability, correla-
tions and regressions; introduc-
tion of tests of significance;
reporting and interpreting
educational research data.

569 SEMINAR IN QUANTITATIVE
TECHNIQUES IN EDUCATION
2 or 3 May be repeated for
credit; cumulative maximum 6
hours. Prereq EdPay 494, 565.
Application of parametric and
nonparametric statistics, data
processing using computer
packages in educational
research.

Elementary/Secondary Education
El/Se

303 TEACHING IN SECONDARY
SCHOOLS 3 Prereq El/Se 300;
EdPay 301. Materials and
general methods for teachers.

315/316 ELEMENTARY PRACTICUM
3 (0-9) Prereq El/Se 304, 306,
307. Extended classroom ex-
perience prior to student teach-
ing providingGradual and
limited classroom involvement
and teaching responsibility.

317/318 SECONDARY PRACTICUM
2 (0-6) or 3 (0-9) Prereq El/Se
303; 10 credits of subject-mat-
ter major. Extended classroom
experience prior to student
Teaching providinggradual and
limited classroom involvement
and teaching responsibility.

534 STUDY SKILLS AND CON-
TENT AREA INSTRUCTION 2
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title and Department</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSHN 575</td>
<td>Food Science and Human Nutrition</td>
<td>Qualifying Experience in Dietetics V 2-16 May be repeated for credit; cumulative maximum 15 hours. By interview only. Supervised professional experience in clinical, administrative, and community dietetics for advanced degree candidates. Meets ADA requirements for qualifying experience.</td>
</tr>
<tr>
<td>FRM 204</td>
<td>Forestry</td>
<td>Characteristics of Forest Trees 1(0-3) Basic field skills in the identification of forest trees; introduction to the use of forestry instruments. (delete prerequisite)</td>
</tr>
<tr>
<td>FRM 304</td>
<td>Cultural History of Forestry 3</td>
<td>Field studies in forest ecology, regeneration, protection, and culture. (delete prerequisite)</td>
</tr>
<tr>
<td>FRM 402</td>
<td>Advanced Silviculture 3-3</td>
<td>Field studies in forest ecology, regeneration, protection, and culture. (delete prerequisite)</td>
</tr>
<tr>
<td>Env S 445</td>
<td>Hazardous Waste Management 3</td>
<td>Environmental, technical, and political aspects of hazardous waste management; evaluation methods, risk assessment, and current management requirements. Credit not granted for both Env S 445 and 545. (delete prerequisite)</td>
</tr>
<tr>
<td>Env S 450</td>
<td>Seminar 1</td>
<td>May be repeated for credit; cumulative maximum 6 hours.</td>
</tr>
<tr>
<td>Env S 550</td>
<td>Special Topics 2</td>
<td>May be repeated for credit; cumulative maximum 6 hours.</td>
</tr>
<tr>
<td>Fin 272</td>
<td>Introduction to Middle Eastern History</td>
<td>History of the Middle East from Muhammad to the present; political and religious development and the impact of empires.</td>
</tr>
<tr>
<td>Fin 273</td>
<td>Foundations of Islamic Civilization</td>
<td>Main ideas and institutions that have characterized Islamic civilization since its founding, presented thematically.</td>
</tr>
<tr>
<td>Hort 515</td>
<td>Seminar in Plant Physiology 1</td>
<td>May be repeated for credit. Same as Agron 515.</td>
</tr>
<tr>
<td>H A 408</td>
<td>Internship in Hotel and Restaurant Administration V 2-12</td>
<td>By interview only. Prereq major in H A. Internship with hotel and restaurant organizations in professional and managerial capacities.</td>
</tr>
<tr>
<td>H A 545</td>
<td>Tourism Strategy and Planning</td>
<td>Three Tourism components; social, economic, and</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
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</tr>
<tr>
<td>313</td>
<td>Engineering Analysis 4</td>
<td>Prereq: Math 315, Cmp 203, C E 314 or c/; major in engineering. Analysis of engineering problems utilizing numerical and mathematical techniques and computers; computer graphics and finite elements methods. Joint listing with the University of Idaho (ME ID390).</td>
</tr>
<tr>
<td>406</td>
<td>Experimental Design</td>
<td>Prereq: M E 306; 404 or c/; major in M E. Designing, conducting, and reporting of experimental investigations involving mechanical equipment.</td>
</tr>
<tr>
<td>416</td>
<td>Design Project 3(1-6)</td>
<td>Prereq: M E 404, 414, 438; major in M E or E E. Design of engineering systems integrating the accumulated background of the curriculum.</td>
</tr>
<tr>
<td>449</td>
<td>Vibrations and Noise Control 3</td>
<td>Prereq major in engineering; M E 348. Analysis of vibrating systems and noise producing mechanisms. Design for noise and vibration control. Joint listing with the University of Idaho (ME ID472).</td>
</tr>
<tr>
<td>474</td>
<td>Advanced Manufacturing Processes 3</td>
<td>Prereq M E 310. Mechanical and metallurgical fundamentals of metal machining and materials processing by deformation; manufacturing systems concepts in production. (drop conjoint listing)</td>
</tr>
<tr>
<td>510</td>
<td>Macroscopic Thermo-Dynamics 3</td>
<td>Advanced thermodynamics from macroscopic viewpoint; basic postulates, equilibrium stability, property relations, application to thermal-fluid and solid mechanics; irreversible thermodynamics. Joint listing with the University of Idaho (ME ID504).</td>
</tr>
<tr>
<td>511</td>
<td>Microscopic Thermo-Dynamics 3</td>
<td>Microscopic development of equilibrium; classical and quantum particle statistics; statistical description of real and ideal gases, solids, and liquids. Joint listing with the University of Idaho (ME ID 522).</td>
</tr>
<tr>
<td>513</td>
<td>Conduction Heat Transfer 2</td>
<td>Prereq M E 404. Analytic methods applied to multidimensional steady-state and transient conduction heat transfer, melting and ablation, numerical methods. Joint listing with the University of Idaho (ME ID545).</td>
</tr>
<tr>
<td>521</td>
<td>Convective Heat Transfer 3</td>
<td>Prereq M E 404, 521. Derivation of the energy conservation equation; laminar and turbulent forced convection heat transfer with internal and external flow, free convection. Joint listing with the University of Idaho (ME ID546).</td>
</tr>
<tr>
<td>522</td>
<td>Viscous Fluid Mechanics 3</td>
<td>Prereq M E 521. Deterministic fluid phenomena, exact solutions of Navier-Stokes equations; boundary layer analysis, vortexity generation and development, stability, and transition. Joint listing with the University of Idaho (ME ID520A).</td>
</tr>
<tr>
<td>548</td>
<td>Acoustics 3</td>
<td>Fundamental principles of linear and non-linear acoustics and its applications. (a/y) (delete prereq)</td>
</tr>
<tr>
<td>551</td>
<td>Turbulent Flow 3</td>
<td>Prereq M E 521 or C E 550. Turbulent flow; dimensional analysis, statistical models and descriptions of organized structures.</td>
</tr>
<tr>
<td>561</td>
<td>Combustion 3</td>
<td>Prereq M E 510 or 511. General combustion phenomena, chemical reactions; combustion modeling, laminar and turbulent flame theory, emissions. (a/y)</td>
</tr>
<tr>
<td>574</td>
<td>Advances in Manufacturing Science 3</td>
<td>Prereq M E 474. Advances in machinability, formability and precision engineering manufacturing processes of preformed and electron components.</td>
</tr>
<tr>
<td>575</td>
<td>Computer Integrated Manufacturing 3</td>
<td>Prereq M E 475. Hierarchical control of manufacturing systems; interface and network considerations; process planning; optimization strategies. (a/y)</td>
</tr>
<tr>
<td>516</td>
<td>Biology of Cells 2</td>
<td>New</td>
</tr>
</tbody>
</table>

SPRING 1988

86
520 CELL AND TISSUE RESPONSE TO INJURY 3 Patterns of cell and tissue response to injury; inflammation, neoplasia. S, F grading.


Microbiology

590 SELECTED TOPICS IN IMMUNOLOGY 1 May be repeated for credit: cumulative maximum 2 hours. Prereq course in immunology. Seminar series on advances in immunology.

Music and Theatre Arts, School of

The faculties and curricula of the Department of Music, and the Theatre Arts and Drama area (formerly in the Department of Speech) have been joined to form a single unit named the School of Music and Theatre Arts. The realignment includes the following changes:
(1) Redesignate the undergraduate and graduate sequences in Theatre Arts and Theatre Arts and Drama within the School of Music and Theatre Arts.
(2) Redesignate existing degrees for students in Theatre Arts and Drama:
(a) Bachelor of Arts in Speech to Bachelor of Arts in Theatre Arts and Drama.
(b) Master of Arts in Speech to Master of Arts in Theatre Arts and Drama.
(3) Transfer the Master of Arts in Teaching degree from Speech to the School of Music and Theatre Arts, and rename the degree Master of Arts in the Teaching of Theatre Arts and Drama.

Music

522 GRADUATE RECITAL 2 May be repeated for credit: cumulative maximum 4 hours. Private screening and public performance as required within each performance emphasis.

Nursing

530 THERAPEUTIC COMMUNICATION IN NURSING 1 Prereq junior in Nurs. Therapeutic communication and relationship development with the well/ill client; various coping strategies used by nurse and client. S, F grading.

540 ETHNIC VARIATION AND NURSING CARE 3 Prereq junior in Nurs or by interview. Health and health care beliefs of other ethnic cultures with implications for nursing and nursing practice.

Nutrition

512 VITAMINS 2 Nutr

513 MINERAL AND VITAMIN METABOLISM 4 Same as 512.

514 MINERAL METABOLISM 3 drop

Pharmacology/Toxicology

410 PRINCIPLES OF PHARMACOKINETICS 1 Fundamental principles of the kinetics of absorption, distribution, and elimination of drugs and other chemicals in biological systems.

501 CONCEPTS OF PHARMACOLOGY/TOXICOLOGY 1 Prereq major in P/T. By interview only. Historical perspective, current characteristics and trends in pharmacology and toxicology. S, F grading.

510 ADVANCED PHARMACOKINETICS 2 Prereq P/T 410. Kinetics of drug absorption, distribution, elimination, and pharmacologic response. (ay)

515 ADVANCED NEUROANATOMY 3 (1-6) Same as 1-6 An 513.

Philosophy

370 ENVIRONMENTAL ETHICS 1 Ethical problems arising from our utilization of natural resources; case studies.

Physical Education

296/297 APPLIED COMPUTER TECHNOLOGY IN PHYSICAL EDUCATION, SPORT, AND RECREATION 1(0-3) Applying computer technologies for controlling data in movement sciences, management, behavior, and performance activities.

312 COACHING OF SWIMMING 1 new Competitive swimming program; equipment; concepts.

566 BIOMECHANICS 3 Prereq PEP 564. Biological and mechanical aspects of movement.

Physical Sciences, new prefix Ph S

230 (Chem 230) COMPUTER SKILLS FOR SCIENCE STUDENTS 2(1-3) Prereq science lab course. Principles and practice of computer usage for controlling scientific experiments, collecting data, analyzing and graphing data and writing reports.

250 (Astr 300) PRINCIPLES OF ASTRONOMY AND PHYSICS 4(3-9) Concepts, principles, and processes from astronomy and physics; for a general student audience.

251 (Astr 301) PRINCIPLES OF CHEMISTRY AND EARTH SCIENCES 4(3-3) Concepts, principles, and processes from chemistry and earth sciences; for a general student audience.

298 (Chem 298) [P] PHYSICAL SCIENCE 103 4(3-3) Concepts from cosmology, astronomy, physics, chemistry, and biochemistry; illustrate how matter evolves from the Big Bang to intelligent life forms.

430 METHODS OF TEACHING PHYSICAL SCIENCE 3(2-3) Prereq Ed/Sci 303; 12 hrs science. Methods, philosophy, and structure of science; application in teaching middle/secondary school physical science courses.

Physics

515 SEMINAR IN COMPUTATIONAL PHYSICS 1 May be repeated for credit: cumulative maximum 4 hours. Computational physics: numerical methods and physical application to supercomputers, mainframes, minis, and microcomputers. S, F grading.

Plant Pathology

525 FIELD PLANT PATHOLOGY 2(0-6) Two week field work at outlying experiment stations studying various aspects of diseases of crop plants. (SS)

Political Science

415 TOPICS IN POLITICAL SCIENCE 3 Study Abroad (Italy).

419 TOPICS IN POLITICAL SCIENCE 3 Study Abroad (Italy).

Psychology

312 EXPERIMENTAL METHODS IN PSYCHOLOGY 3 (2-3) Prereq Psych 105, 311 or stat course. Designing, conducting, and reporting research in selected areas of experimental psychology.

# COURSES THAT MEET GENERAL UNIVERSITY REQUIREMENTS FOR GRADUATION

## H ARTS AND HUMANITIES

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>ANTHROPOLOGY</td>
<td>201, 355</td>
</tr>
<tr>
<td>ARCHITECTURE</td>
<td>120, 121, 202</td>
</tr>
<tr>
<td>ASIA</td>
<td>310[G], 379[G]</td>
</tr>
<tr>
<td>ASIAN/PACIFIC AMERICAN STUDIES</td>
<td>311[G]</td>
</tr>
<tr>
<td>COMMUNICATIONS</td>
<td>101</td>
</tr>
<tr>
<td>DRAMA</td>
<td>180, 365, 366</td>
</tr>
<tr>
<td>FINE ARTS</td>
<td>101, 201, 202</td>
</tr>
<tr>
<td>FOREIGN LANGUAGES</td>
<td>310[G]</td>
</tr>
<tr>
<td>CLASSICS</td>
<td>351</td>
</tr>
<tr>
<td>FRENCH</td>
<td>333, 334</td>
</tr>
<tr>
<td>GERMAN</td>
<td>334</td>
</tr>
<tr>
<td>RUSSIAN</td>
<td>317[G], 351[G]</td>
</tr>
<tr>
<td>HISTORY</td>
<td>101, 102, 340, 341, 342, 343, 360, 373[G]</td>
</tr>
<tr>
<td>INTERIOR DESIGN</td>
<td>101, 103, 110, 111, 198, 202, 204, 310[G], 335</td>
</tr>
<tr>
<td>LANDSCAPE ARCHITECTURE</td>
<td>202</td>
</tr>
<tr>
<td>MUSIC</td>
<td>160, 266[G], 362, 364</td>
</tr>
<tr>
<td>NATIVE AMERICAN STUDIES</td>
<td>101[G], 265[G]</td>
</tr>
<tr>
<td>PHILOSOPHY</td>
<td>101, 107, 198, 201, 220, 300, 306, 310</td>
</tr>
<tr>
<td>SOCIAL SCIENCES</td>
<td>110, 111</td>
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</tbody>
</table>

## I INTERCULTURAL STUDIES*

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ANTHROPOLOGY</td>
<td>300[K], 327, 331</td>
</tr>
<tr>
<td>ASIA</td>
<td>270[K], 275[K], 310[G], 314, 315, 373[G], 374</td>
</tr>
<tr>
<td>ASIAN/PACIFIC AMERICAN STUDIES</td>
<td>315</td>
</tr>
<tr>
<td>CHICANO STUDIES</td>
<td>201[K], 275[K], 311[G], 315</td>
</tr>
<tr>
<td>ENGLISH</td>
<td>110[K]</td>
</tr>
<tr>
<td>FOREIGN LANGUAGES</td>
<td>311[G]</td>
</tr>
<tr>
<td>RUSSIAN</td>
<td>270[K], 310[G]</td>
</tr>
<tr>
<td>SPANISH</td>
<td>317[G], 351[G]</td>
</tr>
<tr>
<td>HISTORY</td>
<td>350</td>
</tr>
<tr>
<td>MUSIC</td>
<td>201[K], 270[K], 275[K], 308[K], 391, 373[G], 374</td>
</tr>
</tbody>
</table>

## S SOCIAL SCIENCES

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>AGRICULTURAL ECONOMICS</td>
<td>201, 320</td>
</tr>
<tr>
<td>AGRICULTURE AND LIBERAL ARTS</td>
<td>320</td>
</tr>
<tr>
<td>ANTHROPOLOGY</td>
<td>101, 198, 203, 303, 304, 309[K], 330</td>
</tr>
<tr>
<td>ASIA</td>
<td>270[K], 275[K]</td>
</tr>
<tr>
<td>BLACK STUDIES</td>
<td>201[K], 203, 275[K]</td>
</tr>
<tr>
<td>CHICANO STUDIES</td>
<td>101[K]</td>
</tr>
<tr>
<td>ECONOMICS</td>
<td>303[U]</td>
</tr>
<tr>
<td>ENVIRONMENTAL SCIENCE</td>
<td>110, 111, 198, 201[K], 220, 231, 270[K], 275[K], 298, 308[K], 320, 361, 382</td>
</tr>
<tr>
<td>FOREIGN LANGUAGES</td>
<td>306[K]</td>
</tr>
<tr>
<td>FORESTRY</td>
<td>101, 102, 198, 222, 333</td>
</tr>
<tr>
<td>HISTORY</td>
<td>105, 198, 350, 355</td>
</tr>
<tr>
<td>NATIVE AMERICAN STUDIES</td>
<td>101, 102, 198, 331, 350, 355</td>
</tr>
<tr>
<td>PSYCHOLOGY</td>
<td>200, 296</td>
</tr>
<tr>
<td>SOCIOLOGY</td>
<td></td>
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<tr>
<td>WOMEN STUDIES</td>
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</tbody>
</table>

## W WRITTEN COMMUNICATION PROFICIENCY

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ANTHROPOLOGY</td>
<td>101[G], 265[G], 308[K], 327, 331</td>
</tr>
<tr>
<td>BIOLOGICAL SCIENCE</td>
<td>314, 315</td>
</tr>
<tr>
<td>COMMUNICATIONS</td>
<td></td>
</tr>
<tr>
<td>AGRICULTURE/HOME ECONOMICS</td>
<td>205</td>
</tr>
<tr>
<td>HISTORY</td>
<td>300</td>
</tr>
<tr>
<td>PHILOSOPHY</td>
<td>102</td>
</tr>
<tr>
<td>SPEECH COMMUNICATIONS</td>
<td>102, 235, 302, 330</td>
</tr>
</tbody>
</table>

## P PHYSICAL SCIENCES

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTRONOMY</td>
<td>135</td>
</tr>
<tr>
<td>CHEMISTRY</td>
<td>101[L], 102[L], 105[L], 106, 115[L], 116, 117[L]</td>
</tr>
<tr>
<td>GEOLGY</td>
<td>101[L], 102[L], 310[L]</td>
</tr>
<tr>
<td>PHYSICS</td>
<td>101[L], 201[L], 380</td>
</tr>
<tr>
<td>PHYSICAL SCIENCES</td>
<td>298[L]</td>
</tr>
</tbody>
</table>

## Z SCIENCES

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVIRONMENTAL SCIENCE</td>
<td>101[U], 303[U]</td>
</tr>
<tr>
<td>FORESTRY</td>
<td>303[U]</td>
</tr>
<tr>
<td>MATHEMATICS</td>
<td>103, 116, 140, 171[L], 196, 202, 206</td>
</tr>
</tbody>
</table>

*course includes laboratory work.

[G] course meets GUR in either intercultural studies or humanities.

[K] course meets GUR in either intercultural studies or social sciences.

[U] course meets GUR in either sciences or social sciences.

## MINORS

A list of approved departmental minors appears in the 1987 Fall Time Schedule. The following minors have been approved since that list was published: Agriculture and Liberal Arts, Alcohol Studies, Communication Disorders, Danish, Entomology, Forestry, Microbiology, Range Management, Soils, Wildland Recreation.

*INTERCULTURAL STUDIES. Effective with the entering freshman class of fall 1985, 3 hours of courses designated as meeting the GUR in Intercultural Studies will be required for graduation.

In addition to those courses designated above as [I], [G], and [K], the Faculty Senate has established the following alternative to fulfilling the Intercultural Studies General University Requirement:

Students who successfully complete foreign study programs in non-Western cultures under the auspices of the Washington State University Office of International Education, or in institutions approved by the Office of Admissions, will have fulfilled the three hour GUR requirement in Intercultural Studies.
1987-89 CATALOG SUPPLEMENT

The following is a composite list which includes curricular changes approved since the publication of the 1987-89 Catalog. New and dropped courses are identified under the course number, other courses have changes such as number, title, credit, prerequisites, or description.

SYMBOL KEY

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>new</strong></td>
<td>the word &quot;new&quot; printed directly under the course number indicates the course was approved since publication of the current catalog.</td>
</tr>
<tr>
<td><strong>drop</strong></td>
<td>the word &quot;drop&quot; printed directly under the course number indicates the course has been dropped.</td>
</tr>
<tr>
<td>210 (101)</td>
<td>changes in course number will appear with the new number listed first and the old number following in parentheses.</td>
</tr>
<tr>
<td>3</td>
<td>the number following the course title indicates the hours of credit.</td>
</tr>
<tr>
<td>(2-3)</td>
<td>the numbers in parentheses following the credit indicate the lecture, laboratory, or studio hours required each week.</td>
</tr>
<tr>
<td>(a/y)</td>
<td>course is taught alternate years.</td>
</tr>
<tr>
<td>(SS)</td>
<td>course is taught summers only.</td>
</tr>
<tr>
<td>c/1</td>
<td>concurrent enrollment.</td>
</tr>
<tr>
<td>V 1-4</td>
<td>the letter &quot;V&quot; preceding the credit indicates the course is offered for variable credit within a semester.</td>
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DESCRIPTION OF COURSES/CURRICULA

Accounting

232 INTERMEDIATE ACCOUNTING 1 Prereq: Acctg 230; Cpt S 105. Theory underlying the determination of income; analysis of financial statements.

338 COST ACCOUNTING 3 Prereq: Acctg 231; Cpt S 105; Math 201, 202; QMeth 215. Management uses of cost information; cost systems and system design; cost analysis.

498 INTERNSHIP IN BUSINESS V 2-15 May be repeated for credit; cumulative maximum 15 hours. By interview only. Internship with a business organization in professional and managerial activities. S, F grading.

506 DOCTORAL TOPICS 3 May be repeated for credit; cumulative maximum 15 hours. Advanced topics in accounting.

Advertising

395 ADVERTISING PRACTICUM V 1-6 May be repeated for credit; cumulative maximum 6 hours. By application only. Credit not granted for both Adver 395 and 495. S, F grading.

480 ADVERTISING AGENCY OPERATION AND CAMPAIGNS 3 Prereq: Adver 380, 382. Principles and functions of advertising management; campaign execution and evaluation. Credit not granted for both Adver 480 and 580.

Aerospace Studies

101 UNITED STATES AEROSPACE FORCES 2 Prereq: curriculum of the U.S. aerospace strategic and defensive forces; relationship of the individual to the Air Force.

201 EVOLUTION OF AEROSPACE POWER 2 Growth and development of airpower doctrine and concepts from the origins of mankind flight through World War II.

311 AIR FORCE LEADERSHIP 3 Prereq: Aero 292 or 291. Professional leadership, responsibilities, and functions required of career Air Force officers; communicative skills.

411 THE PROFESSIONAL MILITARY OFFICER 3 Prereq: Aero 291 or 252. Military officer as a profession, the role of national security forces in the U.S. and military law.

Agricultural Economics

552 AGRICULTURAL PRODUCT DEMAND AND CONSUMPTION ANALYSIS 3 Prereq: Econ 501. Advanced economic theories of demand and consumption with applications to food demands.

Agricultural Engineering

211 PROCESS SIMULATION 3 Same as Ch E 211.

310 (451) SEMINAR 1 May be repeated for credit; cumulative maximum 2 hours. Prereq: junior or senior. Readings and interviews, research, and oral presentation of professional subjects.

352 SOIL AND WATER ENGINEERING 3 Prereq: C E 315, 351. Principles of soil and water resources: plant- and animal-water relationships, applied hydraulics, soil erosion and control, drainage, and legal aspects of water rights. Cooperative course taught at the University of Idaho (AgE ID352).

362 AGRICULTURAL POWER AND MACHINERY 4 Prereq: M E 301 or C E 304, 305. Electric power in agriculture; AC power, distribution, wiring, control, and maintenance. Joint listing with the University of Idaho (AgE ID362).

380 FARM ELECTRIFICATION ENGINEERING 2 Prereq: E E 304, 305. Electric power in agriculture; AC power, distribution, wiring, control, and maintenance. Joint listing with the University of Idaho (AgE ID380).

385 AGRICULTURAL PROCESSING AND ENVIRONMENT 3 Prereq: Ag E 354; C E 315; M E 301 or C E 316, 317. Materials handling and processing, psychometrics, heat and mass transfer, pumps and fans, refrigeration, agricultural environments, waste management. Joint listing with the University of Idaho (AgE ID385).

390 INTRODUCTION TO SOIL AND WATER ENGINEERING 2 Prereq: soils 201, C E 351. Fundamentals of soil and water engineering; agricultural hydrology and hydraulics, erosion control, and water quality.

GLOBAL AGRICULTURAL ENGINEERING 1 May be repeated for credit; cumulative maximum 4 hours. Soil and water engineering and harvesting, handling, and storage of agricultural commodities in a global setting. Credit not granted for both Ag E 420 and 520. S, F grading.

PROCESS CONTROL 3 Same as Ch E 441.

ENGINEERING HYDROLOGY 3 Prereq: C E 351 or Ag E 351. Hydrologic cycle as applied to engineering projects: hydrograph routing; design hydrographs; hydrologic simulation. Cooperative course taught at the University of Idaho (AgE ID451).

DRAINAGE SYSTEM DESIGN 2 Prereq: C E 315. Theory and design of subsurface drainage systems in agriculture, waste management, and construction; unsaturated flow. Credit not granted for both Ag E 454 and 554. Cooperative course taught at the University of Idaho (AgE ID454/554).

FARM STRUCTURES DESIGN 3

FLUID POWER AND CONTROL SYSTEMS 2 Prereq: C E 315. Fluid power and control systems: system design and testing; agricultural applications. Credit not granted for both Ag E 474 and 574. Cooperative course taught at the University of Idaho (AgE ID474/574).

IRRIGATION SYSTEM DESIGN 2 Prereq: C E 352 or 390. Crop water requirements, irrigation scheduling and water management, design of irrigation systems, pump selection. Cooperative course taught at the University of Idaho (AgE ID496).

COOPERATIVE EDUCATION INTERNSHIP V 2-12 May be repeated for credit; cumulative maximum 12 hours. Off-campus Cooperative Education Internship with business, industry, or government unit coordinated through the Professional Experience Program. S, F grading.

GLOBAL AGRICULTURAL ENGINEERING 1 May be repeated for credit; cumulative maximum 4 hours. Graduation level introduction to soils, soil and water engineering; additional requirements. Credit not granted for both Ag E 420 and 520. S, F grading.

DRAINAGE SYSTEM DESIGN

SPRING 1989
2 Graduate level counterpart of Ag E 454; additional requirements. Credit not granted for both Ag E 454 and 554. Cooperative course taught at the University of Idaho (Ag E ID454/554).

574 FLUID POWER AND CONTROL SYSTEMS 2(1-3) Graduate level counterpart of Ag E 474; additional requirements. Credit not granted for both Ag E 474 and 574. Cooperative course taught at the University of Idaho (Ag E ID474/574).

584 INSTRUMENTATION AND MEASUREMENTS 3 (2-3) Prereq Math 172; Phys 102 or 202. Instrumentation systems and measurement concepts, electronic signal-conditioning components and circuitry, digital electronics, and microprocessor basics. Joint listing with the University of Idaho (Ag E ID441/541). Agronomic Mechanics

Ag M 112 ENGINEERING APPLICATIONS IN AGRICULTURE 3 Engineering principles applied to farm machinery, buildings, processing, irrigation, and energy use. Cooperative course taught at the University of Idaho (Ag M ID112).

202 AGRICULTURE SHOP PRACTICES 2(1-3) For Ag M and Ag Ed majors. Operation, use, and care of shop tools and equipment. Cooperative course taught at the University of Idaho (Ag M ID202).

207 METAL FABRICATION PROCESSES 2(1-2) Prereq Ag M 107 and 202 or 201. Principles of joining ferrous and non-ferrous metals, MIG and TIG welding, and metal fabricating projects. Cooperative course taught at the University of Idaho (Ag M ID207).

211 AGRICULTURAL MACHINERY 3 (2-3) Principles, materials of construction, care, capacity of tillage, planting, spraying, harvesting, and materials handling machinery. Joint listing with the University of Idaho (Ag M ID305).

312 ENGINES AND TRACTORS 3 (2-3) Principles of engine operation, fuels, combustion, efficiency, power transmission, energy conversion, power measurement, tractor safety and costs. Joint listing with the University of Idaho (Ag M ID300).

313 SMALL ENGINE REPAIR 1 (0-3) Prereq Ag M 312 or c/w. Repair, adjustment, protective maintenance, operation, and safety of small gasoline engines. Joint listing with the University of Idaho (Ag M ID310).

331 AGRICULTURAL ELECTRIFICATION 3 (2-3) Basic electricity, wiring, and electrical applications in agricultural production. Joint listing with the University of Idaho (Ag M ID331).

344 IRRIGATION AND DRAINAGE 3 Prereq Math 101; Soils 201. Principles of irrigation and drainage, water measurement, irrigation methods and practices, selection of irrigation system components. Joint listing with the University of Idaho (Ag M ID344).

345 IRRIGATION LABORATORY 1 (0-3) Prereq Ag M 344 or c/w. Principles of soil moisture measurement techniques, water measurement, pumps and pump efficiencies, conveyance and distribution systems. Joint listing with the University of Idaho (Ag M ID345).

451 SEMINAR 1 May be repeated for credit; cumulative maximum 2 hours. (was dual listing).

498 COOPERATIVE EDUCATION INTERNSHIP V 2-12 May be repeated for credit; cumulative maximum 12 hours. Off-campus Cooperative Education Internship with business, industry, or government unit coordinated through the Professional Experience Program. S, F grading.

Agriculture and Home Economics

AgHE 404 ETHICAL ISSUES IN AGRICULTURE 3 Not open to freshmen or sophomores. Critical and philosophical analysis of arguments for various positions and policies related to current ethical issues in agriculture.

497 AGRICULTURE/HOME ECONOMICS INTERNSHIP V 2-12 May be repeated for credit; cumulative maximum 12 hours. By interview only. Off-campus professional experience in agriculture and home economics industries. S, F grading.

498 COOPERATIVE EDUCATION INTERNSHIP V 2-12 May be repeated for credit; cumulative maximum 12 hours. Off-campus Cooperative Education Internship with business, industry, or government unit coordinated through the Professional Experience Program. S, F grading.

Agriculture and Liberal Arts

AgLA 101 INSECTS AND PEOPLE: A PERSPECTIVE 2 Same as Entom 101.
HORSES AND HORSEMANSHIP 3 (2-3) Prereq A S 186 or equivalent horse experience. Development, functional use, behavior and management of the horse. 800 800
SEMINAR 1 May be repeated for credit. For juniors. (from S to F to regular letter grading)

COOPERATIVE EDUCATION EXTERNSHIP V 2-8 May be repeated for credit; cumulative maximum in A S 398 and 399 - 12 hours. Cooperative Education Externship in livestock production or related field coordinated through the Professional Experience Program. S, F grading. 804 804

PRACTICUM V 1-8 May be repeated for credit; cumulative maximum in A S 398 and 399 - 12 hours. Directed internship in livestock production and related fields conducted at WSU Centers or on off campus. S, F grading.

VETERINARY CLINICAL NUTRITION 3 Prereq 3rd year in Vet Med. Large and small animal nutrition; nutrient composition, nutritional diseases, and practical feeding methods.

ANIMAL NUTRITION LABORATORY 1 (0-3) Prereq A S 301. Quality control, proximate analysis, and other laboratory methods related to nutritional experiments with animals. Joint listing with the University of Idaho (AnSc ID 415).

ADVANCED DAIRY MANAGEMENT 2 (1-3) Prereq A S 472. Current dairy record keeping and database management systems. Credit not granted for both A S 473 and 573.

RIGHTS AND WELFARE OF ANIMALS 3 Prereq B S 102 or 103. Ethical considerations and welfare of animals used as companions, for food, and in scientific research.

ADVANCED NUTRIENT METABOLISM 6 Prereq A S 404, 410, or FSHN 490; BC/BP 364. Advanced principles of nutrient metabolism in domestic animals and man at organ and cellular levels.

VITAMINS 2

MINERAL AND VITAMIN METABOLISM 4 Prereq A S 404 or 410; BC/BP 364. Absorption, excretion, metabolism, dietary requirements and interactions of mineral and vitamins in animals and humans. (a/y)

ENERGY METABOLISM 3

516 516 PROTEIN AND AMINO ACID METABOLISM 2

518 518 MINERAL METABOLISM 3

548 548 ENDOCRINE PHYSIOLOGY 3 Prereq BC/BP 364. Physiology and chemical of endocrine systems and mechanisms of action of hormones on organs and cellular processes in mammals. Joint listing with the University of Idaho (VetSc ID 508).

549 549 ENDOCRINE PHYSIOLOGY LABORATORY 1 (0-3)

560 560 DOMESTIC ANIMAL GROWTH 3 Prereq A S 404, 410, or 440; BC/BP 364 or 563. Development, differentiation, growth and endocrine regulation of major organ systems in domestic animals. Joint listing with the University of Idaho (AnSc ID 560).

573 573 ADVANCED DAIRY MANAGEMENT 2 (1-3) Graduate counter-part of A S 473; additional requirements. Credit not granted for both A S 473 and 573.

Animal Sciences - delete "Horses" option

Anthropology

230 230 INTRODUCTION TO ARCHAEOLOGY 3 Development of a dynamic picture of past human behavior from archaeological evidence.

303 303 RELIGION IN CULTURE 3

303 [S] RELIGION, MAGIC, AND MYTH 3 Prereq Anth 101; Soc 101 or Psych 105. Religions of non-literate peoples of the world; Eastern, literate religions, especially Hinduism, relationships between religion, society, and culture.

462 462 HUMAN ISSUES IN INTERNATIONAL DEVELOPMENT 3

562 562 HUMAN ISSUES IN INTERNATIONAL DEVELOPMENT 3

Archaeology

342 342 THEORY OF URBAN DESIGN 3 Prereq major in Art or Cat M. Principles and theories of urban planning and design.

496 496 SEMINAR IN COMPUTER APPLICATIONS V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prereq Cpt S 105, 151, 153, 154, or 203. Architectural and construction applications of computer graphics, management computer-aided design. Joint listing with the University of Idaho (Arch ID 584).
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<th>Course Code</th>
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<td>101 [K]</td>
<td>INTRODUCTION TO BLACK STUDIES 3</td>
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<td>336</td>
<td>AGROSTOLOGY 3 (2-3)</td>
<td>Bot 332. Grasses and grasslike plants; economic importance to those in the West. Credit not granted for both Bot 436 and 536.</td>
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<tr>
<td>507</td>
<td>TRANSMISSION ELECTRON MICROSCOPY 4 (2-6)</td>
<td>Same as Zool 507.</td>
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<td>515</td>
<td>SEMINAR IN PLANT PHYSIOLOGY 1</td>
<td>May be repeated for credit. Same as Agron 515.</td>
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<tr>
<td>536</td>
<td>AGROSTOLOGY 3 (2-3)</td>
<td>Graduate level counterpart of Bot 436; additional requirements. Credit not granted for both Bot 436 and 536.</td>
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<tr>
<td>430</td>
<td>CHEMICAL ENGINEERING SEPARATIONS 3 (2-3)</td>
<td>Ch E 310. Design and evaluation of equipment used in distillation, extraction, absorption, and adsorption.</td>
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<td>435</td>
<td>MODERN SEPARATION PROCESSES 3 (2-3)</td>
<td>Ch E 301, 310. Design and operation of separation processes important to emerging technologies: bioseparations, supercritical extraction.</td>
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<td>476</td>
<td>BIOMEDICAL ENGINEERING PRINCIPLES 3 (2-3)</td>
<td>Ch E 301, 310. The application of chemical engineering principles to biological processes in the human body.</td>
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<td>496</td>
<td>COOPERATIVE EDUCATION INTERNSHIP V 2-4</td>
<td>May be repeated for credit, cumulative maximum 4 hours. Off-campus Cooperative Education Internship with business, industry, or government unit coordinated through the Professional Experience Program. S, F grading.</td>
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<td>571 (557)</td>
<td>ADVANCED PLANT DESIGN V 2-3</td>
<td>Design of process plants for optimum cost and economic return; scale-up of pilot plants. Cooperative course taught at the University of Idaho (ChE 10571).</td>
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<td>201</td>
<td>CHEMICAL PROCESS PRINCIPLES AND CALCULATIONS 3</td>
<td>Chm 106, Math 172. Fundamental concepts of chemical engineering, problemsolving techniques and applications in stoichiometry, material and energy balances, and phase equilibria.</td>
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<td>PROCESS SIMULATION 3</td>
<td>Ch E 201, c/l in Math 315. Computer solutions to problems in chemical engineering processing.</td>
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<td>230</td>
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<td>350 [P]</td>
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**New Courses:**
- 330 [new] INTRODUCTION TO TRANSPORT PROCESSES 3
- 331 [new] UNIT OPERATIONS I 4
- 332 [new] UNIT OPERATIONS II 4
- 333 [new] UNIT OPERATIONS III 4
- 345 [new] MODERN SEPARATION PROCESSES 3
- 412 [new] CHEMICAL PROCESS SIMULATION I 1
- 413 [new] CHEMICAL PROCESS SIMULATION II 1
- 414 [new] CHEMICAL PROCESS SIMULATION III 1
- 435 [new] MODERN SEPARATION PROCESSES 3
- 476 [new] BIOMEDICAL ENGINEERING PRINCIPLES 3
- 496 [new] COOPERATIVE EDUCATION INTERNSHIP V 2-4
- 571 (557) [new] ADVANCED PLANT DESIGN V 2-3
- 230 [new] (see Physical Sciences)
- 298 [new] (see Physical Sciences)
- 350 [P] [new] DEVELOPMENT AND INFLUENCE OF CHEMICAL THOUGHT 4 (3-3)
stress; seepage; consolidation and shear strength.

MECHANICS OF STRUCTURES 3 Prereq Cpt S 203; Math 220; C 314. Analysis of statically determinate and indeterminate structures; deflections; influence lines and moving loads; introduction to matrix analysis.

GEOPHYSICAL ENGINEERING 4 (3-3) Prereq Geol 540. Theory and application of exploratory procedures in engineering and geological investigations; review of techniques. Credit not granted for both C 405 and 505.

NUMERICAL GEOLOGY 3 drop

GEOTECHNICAL ENGINEERING II 3

SOIL AND SITE IMPROVEMENT 3 Compaction theory and methods; deep densification of soils; advanced consolidation theory, reloading, vertical drains, chemical stabilization, grouting. Credit not granted for both C 425 and 525.

QUANTITATIVE GEOMORPHOLOGY 3 drop

REINFORCED CONCRETE DESIGN 4 (3-3) Prereq C 330. Behavior, analysis, and design of reinforced concrete structures; fixture, shear, bond; serviceability requirements; design of beams, columns, and slabs.

PRESTRESSED CONCRETE DESIGN 3 Prereq C 433. Behavior, analysis, and design of prestressed concrete structures; fixture, shear, bond, anchorage, zone design; prestress losses. Credit not granted for both C 434 and 534.

INTERMEDIATE HYDROLOGY 3 drop

ADVANCED HYDROLOGY 3 Prereq C 351. 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 C 460 and 560.

SYSTEMS APPROACH TO DESIGN 3 Systems approach to design, project scheduling, problem modeling, optimization, decision making, civil engineering applications.

AIR POLLUTION CONTROL ENGINEERING 3 Prereq senior in Engr or Ph S. Measurement and control of air pollution; engineering design calculations; equipment and process. (a/y) Joint listing with the University of Idaho (CH 3745/575).

SOIL AND SITE IMPROVEMENT 3 Graduate level counterpart of C 425; additional requirements. Credit not granted for both C 425 and 525.

ADVANCED STRUCTURAL DESIGN 3 new

PROBABILISTIC METHODS IN STRUCTURAL ENGINEERING 3 Prereq Stat 360, C 312. Probability applications in structural analysis and design; random vibration applications in earthquake, wind, and wave loadings. Joint listing with the University of Idaho (C 3841).

FINITE ELEMENTS 3 Theory of finite elements; applications to general engineering systems considered as assemblies of discrete elements. Joint listing with the University of Idaho (CE 3846).

ADVANCED REINFORCED CONCRETE DESIGN 3 Prereq C 433, composite design; slab design; limit state design; footings; retaining walls; deep beams; brackets and corbels; torsion; seismic design; shear walls.

PRESTRESSED CONCRETE DESIGN 3 Graduate level counterpart of C 434; additional requirements. Credit not granted for both C 434 and 534.

THEORY OF PLATES AND SHELLS 3

ADVANCED TOPICS IN STRUCTURAL ENGINEERING 3 May be repeated for credit; cumulative maximum 12 hours. Elastic stability, plates and shells, other relevant topics.

ADVANCED TOPICS IN HYDROLOGY V 1-3

ADVANCED HYDROLOGY 3 Graduate level counterpart of C 460; additional requirements. Credit not granted for both C 460 and 560.

APPLIED STREAM SANITATION 3 (2-3)

WEAVING 3 (1-8) Principles, techniques, and aesthetics of hand weaving. Cooperative course taught at the University of Idaho (HEC 3314).

MERCHANDISING I 3 (2-3) Prereq Mdg 360 or cfi. Application of planning and buying principles to merchandising including use of microcomputer for word processing and spreadsheets. Joint listing with the University of Idaho (HEC 3429).

COOPERATIVE EDUCATION INTERNSHIP V 2-12 May be repeated for credit; cumulative maximum 12 hours. Prereq C T 491. Off-campus Cooperative Education Internship with business, industry, or government unit coordinated through the Professional Experience Program.

MERCHANDISING II 3 Graduate level counterpart of C T 418; additional requirements. Credit not granted for both C T 418 and 518.

COMMUNICATIONS

NEWWRITING 3 (2-3) Prereq satisfactory completion on communication writing skills test. The typing proficiency requirement may be waived on an individual basis for otherwise qualified handicapped students.

MASS COMMUNICATIONS THEORIES AND THEORY CONSTRUCTION 3

COMMUNICATION THEORY 3 new Relevant theories and research from mass and interpersonal communication.

C PROGRAMMING LANGUAGE 2 Prereq Cpt S 250. Comprehensive programming practice using C.


INTRODUCTION TO CONSTRUCTION 2 (1-3) Prereq major in Cpt M. Construction industry overview; reading plans and specifications; analysis of the Business Roundtable's Construction Industry Cost Effectiveness project.

THEORY OF URBAN DEVELOPMENT 3 Prereq major in Arch or Cpt M. Principles, theories, and processes contributing to the physical development of the city.

CONSTRUCTION PRACTICE MANAGEMENT I 3 Prereq
senior in Cat M. Design/construction process and project delivery systems/approaches; analysis of construction management: the construction management process.

452 CONSTRUCTION PRACTICE MANAGEMENT II 3 Prereq Cat M 451. Business/management practices for a construction firm; building construction project management.

453 CONSTRUCTION COMMUNICATIONS/LAW/CODES 3 Prereq major in Cat M. Construction communications and law overview; analysis and interpretation of contract documents and the uniform building code.

454 CONSTRUCTION PROJECT MANAGEMENT LAB 1 (O-3)

455 CONSTRUCTION SCHEDULING 3 Prereq major in Cat M. Precedence and arrow networking techniques for construction; fundamentals of scheduling computations, time-cost adjustment, resource leveling; computer scheduling software overview.

466 new METHODS AND PROCEDURES OF CONSTRUCTION I 4 Prereq senior in Cat M. Methods and procedures for site work, foundation construction, concrete construction, equipment, labor, and safety requirements.

467 new METHODS AND PROCEDURES OF CONSTRUCTION II 4 Prereq Cat M 456. Methods and procedures for masonry construction, steel construction, wood and timber construction, high-rise construction, equipment, labor, and safety requirements.

470 ESTIMATING I 3 Prereq major in Cat M. Cost estimating related to building general construction work; methods and techniques applicable to quantity survey, pricing detailed estimates, and bld preparation.

471 new ESTIMATING II 3 Prereq Cat M 470. Computerized construction cost estimating and cost management; personal computer software applications—spreadsheet, file management, data base, and custom type programs.

Continuing and Vocational Education CVE

478 new CAREER DEVELOPMENT AND VOCATIONAL GUIDANCE FOR THE HANDICAPPED 3 Same as CoPay 478

536 MICROCOMPUTERS IN THE VOCATIONAL CLASSROOM: IMPLICATIONS AND APPLICATIONS 3 Philosophical and operational principles and concepts of computer technology; implications for vocational education.

Counseling Psychology

574 new INTRODUCTION TO COUNSELING TECHNIQUES 2 Prereq 9 hrs Educ or Psych; not open to freshmen and sophomores. Practical direct and non-directive counseling techniques for school counselors and classroom teachers. Not open to Ph D students in CoPs.

578 (EdPsy 478) CAREER DEVELOPMENT AND VOCATIONAL GUIDANCE FOR THE HANDICAPPED 3 Prereq major in College of Edu. Concepts of career development and vocational guidance and counseling related to the needs of the handicapped.

511 THEORIES, RESEARCH, AND TECHNIQUES IN COUNSELING PSYCHOLOGY 3 or 4 Philosophical assumptions, theory of personality, counseling process, techniques, and relevant research in the major theories of counseling and personality.

513 CAREER DEVELOPMENT 3 or 4 Theories, concepts, methods, and findings in career development; vocational assessment and prediction; career counseling intervention outcomes.

514 new VOCATIONAL PSYCHOLOGY RESEARCH 3 Prereq CoPay 513. EdPsy 505. Current research in career development and vocational psychology; conceptual issues, research methods, and empirical findings.

515 PROFESSIONAL PROBLEMS IN COUNSELING PSYCHOLOGY 3 Professional problems: ethical, legal and training issues, professional practices, and new professional issues. (delete prereq)

517 THEORETICAL FOUNDATIONS OF GROUP COUNSELING 3 Prereq CoPs 511. History, philosophy, and theoretical foundations; the group counselor, members, and issues in group counseling.

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.

527 INDIVIDUAL APPRAISAL I 4 Prereq EdPsy 508, 509.

Theoretical background and practical skills needed to administer, score, and interpret individual intelligence and structured personality tests; integration of non-test data.

534 new STUDY SKILLS AND CONTENT AREA INSTRUCTION 2 or 3 Same as Ed 534 S (CS)

597 COUNSELING PSYCHOLOGY INTERNSHIP V 2-4 May be repeated for credit; cumulative maximum 6 hours. Supervised internship experience, individual and group counseling, evaluation, assessment, supervision, and teaching S, F grading.

Criminal Justice Crm J

101 INTRODUCTION TO THE ADMINISTRATION OF CRIMINAL JUSTICE 3 Agencies and process involved in the administration of criminal justice. Joint listing with the University of Idaho (CJ ID101).

400 ISSUES IN THE ADMINISTRATION OF CRIMINAL JUSTICE 3 May be repeated for credit; cumulative maximum 12 hours. Prereq major in Crm J. By interview only. Off-campus professional internship in selected criminal justice agencies.

Drama (also see School of Music and Theatre Arts)

419 new TOPICS IN DRAMA - BATH 3 May be repeated for credit; cumulative maximum 6 hours. Topics in drama offered in Bath Study Abroad Program.

420 new TOPICS IN DRAMA - BATH 3 May be repeated for credit; cumulative maximum 6 hours. Topics in drama offered in Bath Study Abroad Program.

490 new INTERNSHIP IN PROFESSIONAL THEATRE V 2-15 Prereq Drama 163 or 263, 396, 260, 264, 360 or 361, 362, 365 or 366. Off-campus experience with Seattle area professional theatres in all aspects of production excluding performance.

501 new RESEARCH METHODS 3 Theory, methods, and practice of research.

504 new INSTRUCTIONAL PRACTICUM 1 May be repeated for credit; cumulative maximum 4 hours. Instruction and guidance in teaching theatre arts and drama. S, F grading.
590 GRADUATE INTERNSHIP IN PROFESSIONAL THEATRE V 2-15 Prereq: S 501 and completion of one academic year of master's level course work in Theatre Arts and Drama at WSU. Internship positions at upper levels of administration or production that require expertise in specific area; theories/practical application. S, F grading.

Economics Econ

340 PUBLIC FINANCE AND TAXATION 3 Prereq: Econ 102, 203. Theory and practice of public finance and administration at local, state, and federal levels.

496 COOPERATIVE EDUCATION INTERNSHIP V 2-12 May be repeated for credit; cumulative maximum 12 hours. Off-campus Cooperative Education Internship with business, industry, or government unit coordinated through the Professional Experience Program. S, F grading.

497 ECONOMICS INTERNSHIP V 2-12 May be repeated for credit; arranged or coordinated by departmental faculty according to student's field of specialization.

511 ECONOMETRICS 3 Prereq: Ag Ec 510; Econ 500, 501. Econometric models; review of linear model; introduction to large sample theory; simultaneous equations modeling.

Educational Psychology

578 Joint listing with the University of Idaho (Edc 1655).

590 INTERNSHIP 3 or 6 May be repeated for credit; cumulative maximum 12 hours. By interview only. Internship in professional positions. S, F grading.

599 SUPERINTENDENT INSTITUTE 2 May be repeated for credit; cumulative maximum 4 hours. By interview only. Current concepts and practices in the superintendency; policy, planning, and implementation techniques. (SS)

Educational Psychology EdPay

478 (See Counseling Psychology)

479 (See Counseling Psychology)

508 EDUCATIONAL STATISTICS 3 Descriptive statistics: central tendency, variability, correlations and regressions; introduction of tests of significance; reporting and interpreting educational research data. (Delete prereq)

560 SEMINAR IN QUANTITATIVE TECHNIQUES IN EDUCATION 2 or 3 May be repeated for credit; cumulative maximum 6 hours. Prereq: EdPay 494, 565. Application of parametric and nonparametric statistics, data processing using computer packages in educational research.

597 NEW 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.

Electrical Engineering

598 Joint listing with University of Idaho (EE 404).

489 NEW TOPICS IN ELECTRICAL AND COMPUTER ENGINEERING V 1-3 May be repeated for credit; cumulative maximum 3 hours. Various topics offered to fit the needs of the WHETS program.

527 ANTENNA THEORY AND DESIGN 3 Prereq: EE 351. Antenna fundamentals, analytical techniques, characteristics and design procedures for selected types of wire, broadband, and aperture antennas. Joint listing with University of Idaho (EE 1504).

574 OPTOELECTRONICS 2 Prereq: EE 504. Methods of modulating, generating, and detecting light; display techniques; display devices; fiber optics.

Elementary/Secondary Education EI/Se


304 TEACHING ELEMENTARY SCIENCE 3 Prereq: EI/Se 300; EdPay 301 or c/f; Astr 301 or 302. Teaching methods and materials in elementary and middle school science.

306 SURVEY OF ELEMENTARY READING AND LANGUAGE ARTS 3 Prereq: EdPay 301. Attitudes, knowledge, and skills needed for successful teaching of reading and language arts.

315/316 NEW ELEMENTARY PRACTICUM AND TESA 3 (0-9) Prereq: EI/Se 304, 306, 307. Extended classroom experience prior to student teaching providing gradual classroom involvement and teaching responsibility including Teacher Expectations Student Achievement training.

317/318 NEW SECONDARY PRACTICUM AND TESA 2 (0-6) Prereq: EI/Se 303; 10 hrs in the subject-matter major. Extended classroom experience prior to student teaching providing gradual teaching responsibility including Teacher Expectations Student Achievement training.


352 NEW TEACHING ELEMENTARY MATHEMATICS 3 Prereq: EI/Se 300; EdPay 300 or c/f; Math 300. Methods and materials for teaching mathematics in elementary and middle school.

385/386 (305) ELEMENTARY AND
MIDDLE SCHOOL SOCIAL STUDIES 3 Prereq Ed/Psy 301 or c/. Teaching methods in elementary and middle school social studies.

390 ELEMENTARY SCHOOL ART EDUCATION 2(1-2) Prereq Ed/Psy 301 or c/. Creative methods for utilizing art media in the elementary classroom.

455 EDUCATIONAL USES OF MICROCOMPUTERS 2-3 Prereq Ed/Se 303 or 304. Types and functions of educational software, evaluation criteria, designing instructional programs and classroom considerations.

485/486 SOCIAL STUDIES IN THE CONTEMPORARY SCHOOL 2 Prereq Ed/Se 300, Ed/Psy 301 or c/. Junior standing. Scope and sequence of the K-8 social studies curriculum, including geography and current world issues.

527 SEMINAR IN TEACHER EDUCATION INSTRUCTION 1 May be repeated for credit; cumulative maximum 4 hours. Prereq teaching experience. Teacher preparation program components and rationale, university teaching strategies and evaluation methods. S, F grading.

534 STUDY SKILLS AND CONTENT AREA INSTRUCTION 2 or 3 Research and practices related to time management, concentration and memory, note-taking, listening, comprehension and thinking skills; applications in subject-matter instruction. (SS)

537 SEMINAR IN LANGUAGE, LITERACY, AND CULTURE 3 Prereq Ed/Se 411. Interrelationships between school, literacy and student cultural background.

538 WRITING ACROSS THE CURRICULUM 3 Writing for learning at grade levels K-12.

548 TEACHING ADOLESCENT LITERATURE 3 Prereq Ed/Se 307 or teaching experience. Evaluating, selecting, and using literature for middle school and teen-age students. (a/y)

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.

562 SECONDARY SCHOOL MATHEMATICS 3 Prereq Ed/Psy 301 teaching experience. Research on curriculum and instruction is-

563 new SEMINAR IN PRECOLLEGE MATHEMATICS EDUCATION 3 Prereq Ed/Se 542 or 562. May be repeated for credit; cumulative maximum 6 hours. Research on curriculum and instruction in mathematics education in grades K-12.

573 English new CONVERSATIONAL-ESL 10(-2) May be repeated for credit; cumulative maximum 2 hours. Oral communication designed specifically to fit the needs of international students.

581 [I] NATIVE AMERICAN LITERATURE 3 Same as Na Am 341.

585 CURRENT CHICANO LITERATURE 3 Same as Ch/St 346.

586 new VANGUARD POETICS IN CHICANO POETRY WRITERS 3 Same as Ch/St 346.

593 new TOPICS IN ENGLISH BATH 3 May be repeated for credit; cumulative maximum 6 hours. Topics in English offered in Bath Study Abroad Program.

594 new TOPICS IN ENGLISH - BATH 3 May be repeated for credit; cumulative maximum 6 hours. Topics in English offered in Bath Study Abroad Program.

596 new SPECIAL TOPICS IN AMERICAN LITERATURE 3 May be repeated for credit; cumulative maximum 9 hours. Graduate level counterpart of Eng 482; additional requirements. Credit not granted for both Eng 482 and 596. (SS)

597 new TOPICS IN AMERICAN STUDIES 3 May be repeated for credit; cumulative maximum 9 hours. Graduate level counterpart of Eng 496; additional requirements. Credit not granted for both Eng 496 and 597. (SS)

Entomology

101 new INSECTS AND PEOPLE: A PERSPECTIVE 2 The World's most abundant animals and their extensive effects on all people yesterday and today. (a/y)

445 (440) FIELD ENTOMOLOGY 1 or 2 May be repeated for credit. Prereq Entom 340 or 343. Field studies of insects; taxonomy, biology, and adaptation to habitats.

484 new INSECT ANATOMY AND PHYSIOLOGY 4 (3-3) Prereq Entom 343. Organ systems of insects and their physiological functions. (a/y) Cooperative course taught at the University of Idaho (Ent ID484/Zool ID494).

596 new DEVELOPMENTAL SYSTEM IN INSECTS 3 Prereq Entom 550 or 484. Insect physiology concentrating on hormones, reproduction, vitalisogenesis, embryology, molting, and metamorphosis. (a/y) Cooperative course taught at the University of Idaho (Ent ID596/Zool 596).
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>335</td>
<td>ENVIRONMENTAL POLICY 3</td>
<td>Prereq Env S 101. Global, national, and regional environmental issues and policy.</td>
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<tr>
<td>370</td>
<td>ENVIRONMENTAL ETHICS 1</td>
<td>Same as Phil 370.</td>
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<tr>
<td>412</td>
<td>NATURAL RESOURCE POLICY AND ADMINISTRATION 3</td>
<td>Same as FRM 412.</td>
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<tr>
<td>445</td>
<td>HAZARDOUS WASTE MANAGEMENT 3(2-3)</td>
<td>Environmental, technical, and political aspects of hazardous waste management; evaluative methods, risk assessment, and current management requirements. Credit not granted for both Env S 445 and 545. (delete prereq)</td>
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</tr>
<tr>
<td>490 (493)</td>
<td>SPECIAL TOPICS 1 May be repeated for credit; cumulative maximum 6 hours</td>
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<tr>
<td>496</td>
<td>COOPERATIVE EDUCATION INTERNSHIP V 2-12 May be repeated for credit; cumulative maximum 12 hours.</td>
<td>By interview only. Practical experience in appropriate agencies; for career students in environmental science.</td>
<td></td>
</tr>
<tr>
<td>574</td>
<td>AIR POLLUTION SEMINAR 1</td>
<td>May be repeated for credit; cumulative maximum 2 hours. Same as C E 574.</td>
<td></td>
</tr>
<tr>
<td>590 (520)</td>
<td>SPECIAL TOPICS 2 May be repeated for credit; cumulative maximum 6 hours</td>
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<tr>
<td>596</td>
<td>COOPERATIVE EDUCATION INTERNSHIP V 2-12 May be repeated for credit; cumulative maximum 12 hours.</td>
<td>By interview only. Practical experience in appropriate agencies; for career graduate students in environmental science.</td>
<td></td>
</tr>
<tr>
<td>210</td>
<td>TOPICS IN FINE ARTS - BATH 3 May be repeated for credit; cumulative maximum 6 hours.</td>
<td>Topics in Fine Arts offered in Bath Study Abroad Program.</td>
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</tr>
<tr>
<td>301</td>
<td>DAIRY PRODUCTS 3(2-3)</td>
<td>Prereq Micro 101 or 201, Org Chem. Specialized techniques and practices of dairy product manufacturing and marketing. Field trip required.</td>
<td></td>
</tr>
<tr>
<td>401</td>
<td>TOPICS IN FOOD SCIENCE AND HUMAN NUTRITION V 1-3</td>
<td>May be repeated for credit; cumulative maximum 6 hours. Selected topics in food science and human nutrition. Credit not granted for both FSHN 401 and 501.</td>
<td></td>
</tr>
<tr>
<td>490</td>
<td>COOPERATIVE EDUCATION INTERNSHIP V 2-6 May be repeated for credit; cumulative maximum 6 hours.</td>
<td>Off-campus Cooperative Education Internship with business, industry, or government unit coordinated through the Professional Experience Program. S, F grading.</td>
<td></td>
</tr>
<tr>
<td>500</td>
<td>TOPICS IN FOOD SCIENCE AND HUMAN NUTRITION V 1-3</td>
<td>May be repeated for credit; cumulative maximum 6 hours. Graduate level counterpart of FSHN 401; additional requirements. Credit not granted for both FSHN 401 and 501.</td>
<td></td>
</tr>
<tr>
<td>503</td>
<td>ADVANCED HUMAN NUTRITION 1</td>
<td></td>
<td></td>
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<tr>
<td>507</td>
<td>ADVANCED NUTRIENT METABOLISM 5 Same as A S 507.</td>
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<tr>
<td>513</td>
<td>MINERAL AND VITAMIN METABOLISM 4 Same as A S 513.</td>
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</tr>
<tr>
<td>575</td>
<td>QUALIFYING EXPERIENCE IN DIETETICS V 2-16 May be repeated for credit; cumulative maximum 16 hours.</td>
<td>By interview only. Supervised professional experience in clinical, administrative, and community dietetics for advanced degree candidates. Meets ADA requirements for qualifying experience.</td>
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<tr>
<td>101</td>
<td>(see Scandinavian)</td>
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</tbody>
</table>

**For Forestry and Range Management: Changed to Department of Natural Resource Sciences.**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>204</td>
<td>CHARACTERISTICS OF FOREST TREES 2(1-3)</td>
<td></td>
<td>Basic field skills in the identification of forest trees, introduction to the use of forestry instruments. (delete prereq)</td>
</tr>
<tr>
<td>300</td>
<td>PROFESSIONAL DEVELOPMENT 1(0-3)</td>
<td></td>
<td>Organizational structure and personnel policies of leading public and private land management agencies.</td>
</tr>
<tr>
<td>302</td>
<td>ADVANCED FOREST AND RANGE ENVIRONMENTS 2(1-3)</td>
<td>Prereq FRM 301, Bot 332. Classification systems used in characterizing Pacific Northwest forest and range communities including indicator and economically important species. Field trips required.</td>
<td></td>
</tr>
<tr>
<td>304</td>
<td>SILVICULTURE 4(3-3)</td>
<td>Prereq FRM 204, FRM 301, or Bio S 372. Stand dynamics, natural regeneration methods and intermediate stand treatment.</td>
<td></td>
</tr>
<tr>
<td>311</td>
<td>FOREST ECONOMICS 3</td>
<td>Prereq Econ 203 or Ag Eco 201. Economic analysis applied to problems in the use of forest lands and resources. (awy)</td>
<td></td>
</tr>
</tbody>
</table>
| 352        | RANGE LIVESTOCK MANAGEMENT 3                                                                   |                                                                               | Range livestock management, nutrition and behavior, plant responses to graz-
<table>
<thead>
<tr>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>399</td>
<td>PROFESSIONAL INTEGRATION 1</td>
</tr>
<tr>
<td>400</td>
<td>PROFESSIONAL DEVELOPMENT II 1</td>
</tr>
<tr>
<td>402</td>
<td>ADVANCED SILVICULTURE 3 (2-3) Prereq FRM 304, 305. Forest genetics, seed collection, nursery practice, planting, and plantation management. Field trips required.</td>
</tr>
<tr>
<td>412</td>
<td>NATURAL RESOURCE POLICY AND ADMINISTRATION 3 Development, content, and implementation of federal public and natural resource policies.</td>
</tr>
<tr>
<td>419</td>
<td>TOPICS IN NATURAL RESOURCES SCIENCES V 1-3 May be repeated for credit; cumulative maximum 9 hours. Topics in natural resource management.</td>
</tr>
<tr>
<td>452</td>
<td>RANGE DEVELOPMENT AND IMPROVEMENTS 3 (2-3) Prereq FRM 351. Developing and improving rangeland forage resources: ecological considerations, plant control, seeding, fertilization, fire, and facilitating animal use. Field trips required. Credit not granted for both FRM 452 and 552.</td>
</tr>
<tr>
<td>455</td>
<td>APPLIED PROBLEMS IN RANGE ECONOMICS 1 (0-3)</td>
</tr>
<tr>
<td>456</td>
<td>RANGE AND RANCH PLANNING 3 (2-3) Prereq Ag Ec 240. Range science and range management; applications of systems analysis and range economics to range management. Field trip required.</td>
</tr>
<tr>
<td>457 (481)</td>
<td>RANGE HABITAT ANALYSIS 4 (2-6) Prereq Stat 310; Cpt S 150. Production, utilization, condition, and trend methodology for livestock and big-game range; computer technology applied. Field trip required. Credit not granted for both FRM 457 and 557.</td>
</tr>
<tr>
<td>501</td>
<td>ADVANCED TOPICS IN SILVICULTURE 2</td>
</tr>
<tr>
<td>502</td>
<td>ADVANCED SILVICULTURE 3 (2-3) Graduate level counterpart of FRM 402; additional requirements. Credit not granted for both FRM 402 and 502.</td>
</tr>
<tr>
<td>504</td>
<td>AGROFORESTRY SYSTEMS 2 Prereq FRM 304. Agroforestry systems used in the world including their current use in developing countries. Cooperative course taught at the University of Idaho (Range ID535).</td>
</tr>
<tr>
<td>505</td>
<td>RANGE DEVELOPMENT AND IMPROVEMENTS 3 (2-3) Graduate level counterpart of FRM 452; additional requirements. Credit not granted for both FRM 452 and 552.</td>
</tr>
<tr>
<td>557</td>
<td>RANGE HABITAT ANALYSIS 4 (2-6) Graduate level counterpart of FRM 457; additional requirements. Credit not granted for both FRM 457 and 557.</td>
</tr>
<tr>
<td>491</td>
<td>PHYSICAL THERAPY CLINICAL EXPERIENCE V 1-4 May be repeated for credit; cumulative maximum 20 hours. Not open to freshmen and sophomores. Prereq Psych 105; Zool 315; major in biology. By interview only. Work experience under supervision of a qualified professional in treatment of human physical disabilities. S, F grading.</td>
</tr>
<tr>
<td>452</td>
<td>CELL BIOLOGY LABORATORY 2 (0-6) Prereq GenCB 450 or CBI 450. Laboratory techniques in cell biology.</td>
</tr>
<tr>
<td>485</td>
<td>MOLECULAR GENETICS V 2-4 Prereq elementary course in genetics. Molecular basis of genetics: DNA, RNA, protein biosynthesis, and genetic engineering (fly). Cooperative course taught at the University of Idaho (Bst ID465).</td>
</tr>
<tr>
<td>560</td>
<td>MOLECULAR GENETICS 3 Prereq GenCB 301, Micro 201; or GenCB 502; BC/BP 563. Biochemical description of genetic processes in microorganisms.</td>
</tr>
<tr>
<td>578</td>
<td>MOLECULAR BIOLOGY COMPUTER TECHNIQUES 3 (2-3) Same as BC/BP 578.</td>
</tr>
<tr>
<td>201</td>
<td>GEOLOGY OF THE NATIONAL PARKS 2 Prereq Geol 101 or 102. Significant geologic features, processes, and geologic history of the National Parks. Field trip required.</td>
</tr>
<tr>
<td>306</td>
<td>FIELD PETROLOGY 3 (2-3) Prereq Geol 101 or 102. Hand sample analysis, petrogenesis and field relationships of rocks. Field trips required.</td>
</tr>
<tr>
<td>317</td>
<td>GEOTECHNICAL ENGINEERING I 4 (3-3) Same as CE 317.</td>
</tr>
<tr>
<td>320</td>
<td>SPRING FIELD TRIP PREPARATION 1</td>
</tr>
<tr>
<td>321</td>
<td>FALL FIELD TRIP 1 (0-3) May be repeated for credit. Prereq Geol 310. One week field trip to study geology of a selected area in the western United States. S, F grading.</td>
</tr>
<tr>
<td>340</td>
<td>GEOLOGIC STRUCTURES 4 (3-3) Prereq Geol 101 or 102; Geol 306, 310. Field trip required.</td>
</tr>
<tr>
<td>409</td>
<td>INTRODUCTION TO GEOSTATISTICS 3 Applications of random variables and probability in geologic and engineering studies, regression, regionalization variables, spatial correlation, variograms, kriging and simulation. Cooperative course taught at the University of Idaho (Geol ID428).</td>
</tr>
<tr>
<td>428</td>
<td>QUANTITATIVE GEOMORPHOLOGY 3</td>
</tr>
<tr>
<td>451</td>
<td>SOIL GENESIS, MORPHOLOGY, AND CLASSIFICATION 3 (2-3) Same as Soils 451.</td>
</tr>
<tr>
<td>480</td>
<td>INTRODUCTORY GEOCHEMISTRY 3 Prereq Geol 350. The chemistry of earth materials and processes.</td>
</tr>
<tr>
<td>492</td>
<td>GEOLOGY OF THE GRAND CANYON 1 (SS)</td>
</tr>
<tr>
<td>571</td>
<td>GEOCHEMISTRY OF HYDROTHERMAL ORE DEPOSITS 3 (2-3) Prereq Geol 470. Ore formation in hydrothermal environments: sulfide mineral stability, water-rock interactions, and stable isotope relationships in altered rocks. Field trip required.</td>
</tr>
<tr>
<td>574</td>
<td>ADVANCED REMOTE SENSING I 2 (0-6) Same as Soils 574.</td>
</tr>
<tr>
<td>575</td>
<td>SEMINAR IN REMOTE SENSING I 1 Same as Soils 575.</td>
</tr>
<tr>
<td>582</td>
<td>MINERAL EQUILIBRIA 2 Prereq Chem 331. Not open to undergraduates. Applications of geochemical thermodynamics to mineralogy and petrology.</td>
</tr>
<tr>
<td>490</td>
<td>INSTRUCTIONAL PRACTICUM V 1-4 May be repeated for credit; cumulative maximum 6 hours. Same as PEP 490. S, F grading.</td>
</tr>
<tr>
<td>272</td>
<td>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.</td>
</tr>
<tr>
<td>273</td>
<td>FOUNDATIONS OF ISLAMIC CIVILIZATION 3 Main ideas and institutions that have characterized Islamic civilization since its founding, presented thematically.</td>
</tr>
<tr>
<td>301</td>
<td>HISTORY OF CHRISTIANITY 3</td>
</tr>
</tbody>
</table>
TOPICS IN HISTORY - BATH 3  
May be repeated for credit; cumulative maximum 5 hours.
Topics in history offered in Bath Study Abroad Program.

TOPICS IN HISTORY - BATH 3  
May be repeated for credit; cumulative maximum 5 hours.
Topics in history offered in Bath Study Abroad Program.

HISTORY OF SCANDINAVIA 3  
A history of Scandinavia from earliest historical times to the present.

HISTORY OF BLACKS IN THE WESTERN U.S. 3  
Same as BL ST 370.

TECHNOLOGY AND SOCIAL CHANGE TO 1900 3  
The emergence of modern technological society with emphasis on the period 1750-1900.

NATIVE PEOPLES OF CANADA: HISTORICAL PERSPECTIVES 4  
The history of the native peoples of Canada (Indians, Metis, Inuits) and native-white interaction from 1500 to the present. (AY)

SEMINAR IN AMERICAN HISTORY 3  

TOPICS IN HISTORY 3 Study Abroad (Italy).

TOPICS IN HISTORY 3 Study Abroad (Italy).

SEMINAR IN HISTORY 3 May be repeated for credit.

TWENTIETH CENTURY MIDDLE EAST 3  
Developments in the Middle East since World War I, nationalism, fundamentalism, and revolution. Credit not granted for both Hist 472 and 572.

SPECIAL TOPICS IN AMERICAN CULTURE 3  
May be repeated for credit; cumulative maximum 9 hours. Same as Engr 582. Graduate level counterpart of Hist 494. Additional requirements. Credit not granted for both Hist 494 and 594. S, F grading.

COOPERATIVE EDUCATION INTERNSHIP V 2-12  
May be repeated for credit; cumulative maximum 9 hours. Same as Engr 582. Graduate level counterpart of Hist 494. Additional requirements. Credit not granted for both Hist 494 and 594. S, F grading.

TOPICS IN AMERICAN STUDIES 3  
May be repeated for credit; cumulative maximum 9 hours. Same as Engr 582. Graduate level counterpart of Hist 494. Additional requirements. Credit not granted for both Hist 494 and 594. S, F grading.

HISTORY INTERNSHIP V 2-12  
May be repeated for credit; cumulative maximum 9 hours. Same as Engr 582. Graduate level counterpart of Hist 494. Additional requirements. Credit not granted for both Hist 494 and 594. S, F grading.

Horticulture  

INTRODUCTION TO HORTICULTURAL SCIENCE 4 (3-3)  
Preex Bot 120. Fundamentals of plant growth and development at the cellular and whole plant levels as influenced by environmental and management decisions.

ADVANCED TOPICS IN HORTICULTURE V 1-4  
May be repeated for credit; cumulative maximum 8 hours. Prereq Bot 320. Current topics and research techniques in horticulture.

SEMINAR IN PLANT PHYSIOLOGY 1-2  
May be repeated for credit; cumulative maximum in Hist 494 and 498-12 hours. Prereq major or minor in history. Participation as intern in public or private sectors. Credit not granted for both Hist 498 and 598. S, F grading.

TWENTIETH CENTURY MIDDLE EAST 3  
Graduate level counterpart of Hist 472; additional requirements. Credit not granted for both Hist 472 and 572.

SPECIAL TOPICS IN AMERICAN CULTURE 3  
May be repeated for credit; cumulative maximum 9 hours. Same as Engl 582. Graduate level counterpart of Hist 482. Additional requirements. Credit not granted for both Hist 482 and 582. (SS)

COOPERATIVE EDUCATION INTERNSHIP V 2-12  
May be repeated for credit; cumulative maximum 9 hours. Same as Engr 582. Graduate level counterpart of Hist 484. Additional requirements. Credit not granted for both Hist 484 and 594. S, F grading.

FINANCE 5 (3)  
Preex Econ 271. Bus 231. Financial decision-making, financial strategies, investment in current and fixed assets, financial instruments, and capital markets. (SCHRA)

TOPICS IN HUMANITIES - BATH 3  
May be repeated for credit; cumulative maximum 6 hours. Topics in humanities offered in Bath Study Abroad Program.

REASON, ROMANTICISM, AND REVOLUTION 3  
Integrated humanities, literature, philosophy, history, art, and music of the Modern World.

SOUTHERN ASIAN LITERATURES AND THOUGHT 3  
Same as For L 510.

TOPICS IN HUMANITIES - BATH 3  
May be repeated for credit; cumulative maximum 6 hours. Topics in humanities offered in Bath Study Abroad Program.

Move from Adult and Youth Education to Entomology.

COOPERATIVE EDUCATION INTERNSHIP V 2-4  
May be repeated for credit, cumulative
maximum 7 hours. By interview only. Off-campus Cooperative Education Internship with business, industry, or government unit coordinated through the Professional Experience Program. S, F grading.

Field of Specialization - change in designation from Insurance to Insurance and Risk Management.

320 RISK AND INSURANCE 3 Prereq B Law 210, Econ 102 or 201. Types of risk and methods of protection; life, health, property, and liability insurance, principles of risk management.

321 LIFE INSURANCE AND FINANCIAL PLANNING 3 Prereq Ins 320. Management of the life, health, and disability insurance risks facing the individual, business, and society; financial planning.

420 BUSINESS RISK MANAGEMENT 3 Prereq Ins 320. Management of business risk insurance, analysis of risk, methods of handling risk assumption, combination, transfer, loss control and avoidance.

498 INTERNSHIP IN BUSINESS V 2-15 May be repeated for credit; cumulative maximum 15 hours. By interview only. Internship with a business organization in professional and managerial activities. S, F grading.

JOURNALISM

395 JOURNALISM PRACTICUM V 1-6 May be repeated for credit; cumulative maximum 6 hours. By application only. Credit not granted for both Jour 395 and 495. S, F grading.

425 REPORTING OF PUBLIC AFFAIRS 3 Prereq Jour 305. Research leading to publication of journalistic articles. Credit not granted for both Jour 425 and 525.

430 CRITICAL WRITING 3 Criticism, editorial opinions, reviews, and commentaries through different media.

525 REPORTING OF PUBLIC AFFAIRS 3 Graduate level counterpart of Jour 425; additional requirements. Credit not granted for both Jour 425 and 525.

Latin American Studies Minor in (see p. 84)

Management

315 WOMEN IN MANAGEMENT 3 New Same as W St 315.

350 BUSINESS INFORMATION SYSTEMS 2 Prereq Cpt S 105 Information systems foundations, development, applications, and management in business.

498 INTERNSHIP IN BUSINESS V 2-15 May be repeated for credit; cumulative maximum 15 hours. By interview only. Internship with a business organization in professional and managerial activities. S, F grading.

596 DOCTORAL TOPICS 3 May be repeated for credit; cumulative maximum 15 hours. Advanced topics in management.

MARKETING

360 MARKETING MANAGEMENT 3 Prereq Acctg 230 or c/f, Econ 101 or 201, Econ 203 or c/f. Analysis of marketing policy; approaches to solution of market- ing problems.

SPECIAL TOPICS 3 May be repeated for credit; cumulative maximum 6 hours.

INTERNATIONAL BUSINESS

498 INTERNSHIP IN BUSINESS V 2-15 May be repeated for credit; cumulative maximum 15 hours. By interview only. Internship with a business organization in professional and managerial activities. S, F grading.

DOCTORAL TOPICS 3 May be repeated for credit; cumulative maximum 15 hours. Advanced topics in marketing.

Materials Science and Engineering - Certification Requirements (see p. 83)

Materials Science and Engineering


320 (220) METALLOGRAPHY 2 (0-6) Prereq MSE 301 or c/f, major in Engr. Principles and techniques of optical metallography and other laboratory methods used in modern materials science and engineering.

331 PROCESS METALLURGY 3 Drop

401 METALLIC MATERIALS 3 Prereq MSE 301. Major alloy systems and manufacturing processes; materials selection.

533 FRACTURE OF POLYMERS AND COMPOSITES 3 Deformation and fracture of polymers and composites; effects of environment; relationship to microstructure.

Mathematics - Certification Requirements (see p. 84)

Mathematics

251 (200) NUMBER SYSTEMS 3 Prereq 2 yrs HS algebra or Math 101 Logical and historical development of present-day number systems and associated algorithms; methods of problem solving.

252 INFORMAL GEOMETRY 3 New Prereq 1 yr HS geometry; Math 251. Informal approach to basic ideas; mensuration, graphing, geometrical constructions, similarity, congruence, tessellations, symmetry, transformations.

351 (300) TOPICS FOR ELEMENTARY
SCHOOL TEACHERS 3 Prereq Math 251, 252. Real number system, elementary probability and statistics, coordinate geometry, and number theory.

408 CAREER EXPERIENCE INTERNSHIP V 2-12 May be repeated for credit, cumulative maximum 12 hours. By interview only. Industrial or governmental career experience in a mathematics or mathematics-related area, supervised by qualified professionals. S, F grading.

562 SECONDARY SCHOOL MATHEMATICS EDUCATION 3 Same as E Va So 562. Joint listing with the University of Idaho (Math 564).

589 SEMINAR IN PRECOLLEGE MATHEMATICS EDUCATION 3 Same as E Va 589.

Mechanical Engineering

305 THERMAL AND FLUIDS LABORATORY 1 (0-3) Prereq M E 302 or 303 or c/l, major in engr. Measurement data acquisition techniques and theory verification in the thermal and fluid sciences.

312 KINEMATIC ANALYSIS 3 Prereq C E 212, major in engr. Motion transfer, velocity, acceleration, and inertia forces in machines; static and dynamic force systems, cam profiles, gears and gearing systems. Joint listing with the University of Idaho (ME ID524).

313 ENGINEERING ANALYSIS 4 Prereq Math 315. Cpt S 203; C E 314 or c/l; major in engr. Analysis and modeling of engineering problems utilizing numerical and mathematical techniques and computers, computer graphics and finite elements methods. Joint listing with the University of Idaho (ME ID530).

406 EXPERIMENTAL DESIGN 3 (1-6) Prereq M E 305, 404 or c/l; major in M E. Designing, conducting, and reporting of experimental investigations involving mechanical equipment.

416 DESIGN PROJECT 3 (1-6) Prereq M E 302, 414, 404 or c/l; major in M E. Design of engineering systems integrating elements of applied mechanics and the thermal sciences.

R416 DESIGN OF ENGINEERING SYSTEMS 3 (qr) Prereq M E R413. Design of mechanical systems integrating thermal science and solid mechanics. Tri-Cities University Center.

R417 DESIGN OF THERMAL SYSTEMS 3 (qr) Prereq M E R328, R340. Detailed design of thermal power systems. Tri-Cities University Center.

417 DESIGN OF THERMAL SYSTEMS 3 (1-6)

449 VIBRATIONS AND NOISE CONTROL 3 Prereq major in engr; M E 348. Vibrating systems and noise producing mechanisms; design for noise and vibration control. Joint listing with the University of Idaho (ME ID472).

474 ADVANCED MANUFACTURING PROCESSES 3 Prereq M E 310. Mechanical and metallurgical fundamentals of metal machining and materials processing by deformation, manufacturing systems concepts in production. (drop conjoint listing)

475 MANUFACTURING AUTOMATION 3 (2-3) Prereq M E 310, 348. Computer control of manufacturing processes; numerically controlled machine tools, robotics, control algorithms, component and system design (drop conjoint listing)

510 MACROSCOPIC THERMODYNAMICS 3 Advanced thermodynamics from macroscopic viewpoint, basic postulates, equilibrium stability, property relations; application to thermal-fluid and solid mechanics; irreversible thermodynamics. Joint listing with the University of Idaho (ME ID524).

511 MICROSCOPIC THERMODYNAMICS 3 Microscopic development of classical and quantum particle statistics, statistical description of real and ideal gases, solids, and liquids. Joint listing with the University of Idaho (ME ID522).

513 CONDUCTION HEAT TRANSFER 2 Prereq M E 404. Analytic methods applied to multidimensional steady-state and transient conduction heat transfer, melting and ablation, numerical methods. Joint listing with the University of Idaho (ME ID465).

515 CONVECTION HEAT TRANSFER 3 Prereq M E 404, 521. Derivation of the energy conservation equation, laminar and turbulent forced convection heat transfer with internal and external flow, free convection. Join listing with the University of Idaho (ME ID546).

521 FUNDAMENTALS OF FLUID MECHANICS 4 Prereq ME 303. Governing equations of fluid mechanics accompanied by applications of Navier-Stokes equations to simple flow situations, boundary layer analysis.

522 VISCous FLUID MECHANICS 3 Prereq M E 521. Deterministic fluid phenomena, exact solutions of Navier-Stokes equations, boundary layer analysis, vorticity generation and development, stability, and transition. Joint listing with the University of Idaho (ME ID520A).

545 NONLINEAR DYNAMICS 3 Prereq M E 540. Fundamentals of nonlinear oscillations, stability theory, perturbation methods, and chaotic behavior in nonlinear dynamical systems. (e/v)

546 ACOUSTICS 3 Fundamental principles of linear and nonlinear acoustics and its applications. (e/v), (delete prereq)

550 INTERMEDIATE FLUID MECHANICS 3 Same as C E 550.

551 TURBULENT FLOW 3 Prereq M E 521 or C E 550. Turbulent flow; dimensional analysis, statistical models and descriptions of organized structures.

561 COMBUSTION 3 Prereq M E 510 or 511. General combustion phenomena, chemical reactions, combuster modeling, laminar and turbulent flame theory, emissions. (e/v)

574 ADVANCED MANUFACTURING PROCESS 3

574 ADVANCES IN MANUFACTURING SCIENCE 3 Prereq M E 475. Advances in machinability, formability and precision engineering, new manufacturing processes of precised and electronic components.

575 COMPUTER INTEGRATED MANUFACTURING 3 Prereq M E 475. Hierarchical control of manufacturing systems; interface and network considerations, process planning, optimization strategies. (e/v)

581 CONTROL SYSTEMS 3

Medical Sciences

Med 5

520 CELL AND TISSUE RESPONSE TO INJURY 3 Patterns of cell and tissue response to injury; inflammation; neoplasia. S, F grading.


Microbiology

464 TECHNIQUES IN MOLECULAR BIOLOGY 3 (1-6) Prereq Micro 201; Gen CB 901; BC/BP 364,
Inhabitants, image and counter image, with emphasis on the 20th century.

NATIVE PEOPLES OF CANADA: HISTORICAL PERSPECTIVES 4 Same as Hist 406.

NATIVE PEOPLES OF THE PACIFIC NORTHWEST 3

Natural Resource Science, Department of
(was Forestry and Range Management)

Naval Science

SEMINAR V 1-2 By interview only. Cooperative course taught by the University of Idaho.

EVOLUTION OF WARFARE 3
Evolution of war through tactics, strategy from Sun Tzu to J.F.C. Fuller. Cooperative course taught by the University of Idaho.

SEMINAR V 1-2 By interview only. Cooperative course taught by the University of Idaho.

NURSING CONCEPTS: PARENCH 5

NURSING CONCEPTS: FAMILY AND CHILD DEVELOPMENT 2 Prereq Nurs 321 or by interview. Physical, cognitive, psychosocial, and moral development of children, infancy through adolescence; theoretical framework; family development and family therapy.

NURSING PRACTICE: PARENCH 6(0-18)

NURSING CONCEPTS: MATERNITY NURSING 2 Prereq Nurs 321, 340 or c/ or by interview. Normal reproductive processes and common health problems associated with reproduction; assessment and nursing care during the antepartum, intrapartum, and postpartum cycles.

NURSING PRACTICE: MATERNITY NURSING 3 (0-9) Prereq Nurs 321, 340 or c/; Nurs 342 or c/ or by interview. Experience in the care of mothers in the antepartum, intrapartum, and postpartum periods and newborns; family care and family planning.

NURSING CONCEPTS NURSING OF CHILDREN 2 Prereq Nurs 321, 340, or c/ or by interview. Normal growth and development concepts applied to maintenance of child health, care of acutely ill hospitalized children, and needs of children requiring chronic care.

THERAPEUTIC COMMUNICATION IN NURSING 1 Prereq junior in Nurs. Therapeutic communication and relationship development with the well/ill client; various coping strategies used by nurse and client. S, F grading.

NURSING CONCEPTS: ADULT 5 Prereq Nurs 340, 341 or by interview. Theoretical basis for nursing management of clients throughout the adult lifespan; health/illness problems which occur commonly in society.

NURSING PRACTICE: COMMUNITY HEALTH 4 (0-12) Prereq Nurs 403 and Nurs 440, or c/. Clinical experience providing nursing services in selected community settings; community assessment strategies; application of management theory.

NURSING CONCEPTS: PSYCHIATRIC/MENTAL HEALTH 3 Prereq Nurs 402, 421, or by interview. Nursing process with clients experiencing psychiatric/mental health disruptions; history, theories, legal/ethical issues of psychiatric/mental health nursing.

ETHNIC VARIATION AND NURSING CARE 3 Prereq junior in Nurs or by interview. Health and health care beliefs of other ethnic cultures with implications for nursing and nursing practice.
elimination, dosage regimen design, bioavailability.

437 [313] PHARMACEUTICS LABORATORY I 1 (0-3) Prereq Pha 451 or c/. Laboratory in the preparation of solutions, solid, semisolid, and dispersed liquid dosage forms.


443 new PHARMACOLOGICAL BASIS OF THERAPEUTICS III Prereq Phar 442, Chem 342; Zool 315, 353. Medicinal chemistry, pharmacology and toxicology of drugs acting on the peripheral nervous system, antidepressants, cardiovascular, renal and gastrointestinal drugs.

444 new PHARMACOLOGICAL BASIS OF THERAPEUTICS IV Prereq Phar 443. Medicinal chemistry, pharmacology and toxicology of drugs acting on the central nervous system, endocrine agents and microorganisms.

446 new PHARMACOLOGICAL BASIS OF THERAPEUTICS LABORATORY I 1 (0-3) Prereq Phar 443. Case studies in clinical pharmacology, pharmacokinetics, and drug development.

451 new PHARMACY PRACTICE I 1 Basic clinical skills, interpretation of patient data, problem-solving skills, professional communications, professionalism and pharmacy ethics.


453 [436] PHARMACY PRACTICE III 2 Prereq Phar 452; Chem 342; Micro 101; BC/BCP 364. Clinical therapeutics of chemotherapeutic agents and the pharmacist's role in monitoring efficacy and toxicity in patients.

454 (409) PHARMACY PRACTICE IV 3 (1-6) Prereq Phar 433, 437, 443. Professional competence in applying principles of pharmacology, medicinal chemistry, and pharmaceutics to therapeutics, procedures.

455 (401) PHARMACY PRACTICE V 4-5 Prereq Phar 446, 454, 415. Bio-pharmaceutics and pharmacology applied to clinical situations, drug information and evaluation of disease state.

457 new CLINICAL PHARMACOKINETICS 2 Prereq Phar 445, 445; c/ in Phar 455. Application of basic pharmacokinetics principles to patient care.

461 (405) COMMUNITY PRACTICE EXTERNALSHIP 6 (0-18) Prereq Phar 455. Externship providing practical professional experience in community pharmacy setting under the supervision of an approved pharmacist preceptor.

462 new INSTITUTIONAL PHARMACY EXTERNALSHIP 6 (0-18) Prereq Phar 455. Externship providing practical professional experience in institutional pharmacy practice under the supervision of an approved pharmacy preceptor. S, F grading.

463 (408) CLINICAL CLERKSHIP 6 (0-18) Prereq Phar 455. Clerkship providing clinical experience in the delivery of health care and the role of the pharmacist in patient care. (delete repeat credit)

464 TOXICOLOGY 3

471 CHEMICAL PHARMACOLOGY 4

472 PHARMACODYNAMICS 5

473 PHARMACOLOGY LABORATORY I 1 (0-3)

485 new PHARMACY PRACTICE SEMINAR 1 Prereq Phar 464, 461, 462, 463, or c/. Professional standards of practice, a companion course for experiential education courses.

Philosophy

370 ENVIRONMENTAL ETHICS 1 Ethical problems arising from our utilization of natural resources; case studies.

404 ETHICAL ISSUES IN AGRICULTURE 3 Same as AgHE 404.

420 EXISTENTIALISM 3 Prereq 3 hrs Phil. The movement of religious and non-religious exis-
485 RIGHTS AND WELFARE OF ANIMALS Same as A S 485.

497 SEMINAR IN PEACE STUDIES 2 May be repeated for credit; cumulative maximum 4 hours. Senior seminar topics relating to conflict and peace.

Physical Education, Majors/Minors, (see pp. 94, 95)

Physical Education

PEP

282 (261) HUMAN ANATOMY 3 (2-3) Human skeletal structure and articulations; skeletal musculature; the nervous, respiratory, and circulatory system.

299 INTRODUCTION TO YOUTH SPORTS 1 Same as RLS 289.

296/297 APPLIED COMPUTER TECHNOLOGY IN PHYSICAL EDUCATION, SPORT, AND RECREATION 1 (0-3) Applying computer technologies for controlling data in movement sciences, management, behavior, and performance activities.

302 COACHING OF SWIMMING 1 Compulsive swimming program; equipment, concepts.

315 EVALUATION IN PHYSICAL EDUCATION 3 (2-3) Prereq PEP 296. Tests, their administration and use, use of computers, interpretation and use of statistics; formation of sound grading systems.

317/318 SECONDARY PRACTICUM 2 (0-6) or 3 (0-9) Same as E/S 317/318.

319 (317) PERFORMING DANCE TECHNIQUES 2 (0-6) Prereq PEP 237 or competency. Methods and materials in modern dance, jazz dance, and ballet.

364 FITNESS 2 (1-3) Prereq PEP 362, 363 or c/. Fitness and body mechanics related to human movement.

472 ELEMENTARY PHYSICAL EDUCATION K-8 2 (1-3) Prereq PEP 364. For education majors. Knowledge, materials, methods and lab experiences for teaching motor patterns and skill acquisition in the elementary grades K-8.

473 ELEMENTARY PHYSICAL EDUCATION K-8 2 (1-3) Prereq PEP 364. For physical education majors. Content, methods and analysis of teaching motor patterns and skills for elementary grades K-6.

476 EXERCISE TESTING AND PRESCRIPTION 3 (2-3) Prereq PEP 261, 383; Zool 251. Principles of exercise testing and prescription based on current practices in physical education, physiology, and rehabilitation.

481 ANALYSIS OF HUMAN MOVEMENT 3 (2-3) Prereq senior in P.E. Development of knowledge and skills which assist the physical education teacher in planning for and responding to student skill learning.

482 METHODS OF TEACHING SECONDARY PHYSICAL EDUCATION 3 (2-3) Prereq PEP 481 or c/. Management, teaching styles, lesson design, and analysis of teaching.

484 PRINCIPLES OF MOVEMENT FOR INDIVIDUALS WITH DISABILITIES 3 (2-3) Knowledge, understanding, and skills for teaching movement activities to individuals with disabilities, practical required.

505 ADVANCED EXERCISE PHYSIOLOGY 3 Prereq PEP 363. Metabolic adjustment made in response to exercise and training with major emphasis upon research findings.

566 BIOENGINEERING 1 Prereq PEP 564 Biological and mechanical aspects of movement.

567 OBSERVATION AND ANALYSIS OF TEACHING PHYSICAL ACTIVITY 3 (2-3) Systematic approach to observation/analysis of teaching physical activity including evaluation of instructional process.

568 TEACHING STRATEGIES IN PHYSICAL ACTIVITY 2 Prereq teaching experience. Designing teaching strategies for a K-12 setting in physical activity.

585 CURRICULUM DEVELOPMENT IN K-12 PHYSICAL EDUCATION 2 Principles of curriculum development and the process of instruction as the vehicle to implement curricular decisions.

590 INTERNSHIP V 2-12 May be repeated for credit, cumulative maximum 12 hours. By interview only. Internship in educational, industrial, municipal or private sports or recreational setting, direct participation in tasks, research, and reporting activities. S, F, grading.

Physical Sciences, new prefix Ph S Ph S

230 (Chem 230) COMPUTER SKILLS FOR SCIENCE STUDENTS 2 (1-3) Prereq science lab course. Principles and practice of computer usage for controlling scientific experiments, collecting data, analyzing and graphing data and writing reports.

250 (Astr 300) [P] PRINCIPLES OF ASTRONOMY AND PHYSICS 4 (3-3) Concepts, principles, and processes from astronomy and physics for a general student audience.

251 (Astr 301) PRINCIPLES OF CHEMISTRY AND EARTH SCIENCES 4 (3-3) Concepts from cosmology, astronomy, physics, chemistry, and biochemistry; illustrates how matter evolves from the Big Bang to intelligent life forms.

499 SPECIAL PROBLEMS V 1-4 May be repeated for credit. S, F grading.

Physics

499 SPECIAL PROBLEMS V 1-4 May be repeated for credit. S, F grading.

501 SEMINAR IN COMPUTATIONAL PHYSICAL 1 May be repeated for credit; cumulative maximum 4 hours. Computational physics, numerical methods and physical application to supercomputers, mainframes, minis, and microcomputers. S, F grading.

512 METHODS IN PLANT VIRUS RESEARCH 2 (1-3) Prereq Pl P 511. Laboratory and greenhouse research methods used for serology, identification, characterization and transmission of plant viruses. (SS)

525 FIELD PLANT PATHOLOGY 2 (0-6) Two week field work at outlying experiment stations studying various aspects of diseases of crop plants. (SS)

Political Science

316 AMERICAN PUBLIC POLICY 3 New Institutions, processes, and substantive issues of American public policy and policy formation.

408 TOPICS IN POLITICAL SCIENCE - BATH 3 May be repeated for credit; cumulative maximum 6 hours. Topics in
<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>415</td>
<td>Topics in Political Science</td>
<td>Study abroad (Italy).</td>
</tr>
<tr>
<td>419</td>
<td>Topics in Political Science</td>
<td>Study abroad (Italy).</td>
</tr>
<tr>
<td>420</td>
<td>Israel Studies 3</td>
<td>(2-3) Topics related to Israel and Middle Eastern politics and society presented at the Israel Studies Institute in Jerusalem.</td>
</tr>
<tr>
<td>421</td>
<td>International Law 3</td>
<td></td>
</tr>
<tr>
<td>424</td>
<td>International Political Conflict and War 3</td>
<td>Prereq Pol S 222. Theories and research concerned with the presence and incidence of international conflict and war in the world system. Credit not granted for both Pol S 424 and 524.</td>
</tr>
<tr>
<td>491</td>
<td>Cooperative Education Internship V 2-12</td>
<td>May be repeated for credit; cumulative maximum 12 hours. Off-campus Cooperative Education Internship with business, industry, or government unit coordinated through the Professional Experience Program. S, F grading.</td>
</tr>
<tr>
<td>521</td>
<td>Behavior Modification 3</td>
<td>(2-3) Prereq Psych 390, 520. Learning principles applied to modifying behavior of children and adults in institutions, clinics, and schools.</td>
</tr>
<tr>
<td>522</td>
<td>Cross Cultural Issues in Psychology 3</td>
<td>Thesories and research in cross cultural psychology; cultural difference in psycho-pathology, assessment and treatment.</td>
</tr>
<tr>
<td>524</td>
<td>Clinical Internship in Psychology V 2-16</td>
<td>May be repeated for credit; cumulative maximum 16 hours. Prereq passing of prelims and completion of course work for PhD Clinical training in an internship approved by American Psychological Association or by WSU. S, F grading.</td>
</tr>
<tr>
<td>610</td>
<td>Recreation for Special Populations 3</td>
<td>History, etiology, characteristics, services, resources, professional competencies and opportunities; recreation programs. Credit not granted for both RLS 110 and 383. Cooperative course taught at the University of Idaho (Rec ID 110).</td>
</tr>
<tr>
<td>230</td>
<td>Principles of Therapeutic Recreation 3</td>
<td>Prereq RLS 110. Philosophy, design, and development of recreation programs for persons with disabling conditions; theory and rationale of therapeutic recreation. Credit not granted for both RLS 230 and 460. Cooperative course taught at the University of Idaho (Rec ID 230).</td>
</tr>
<tr>
<td>312</td>
<td>Principles of Public Relations 3</td>
<td>Prereq Com 225. Principles, theory, methods and objectives of public relations; public relations problems and practices.</td>
</tr>
<tr>
<td>313</td>
<td>Public Relations Techniques and Media Usage 3</td>
<td>(2-3) Prereq Jour 305; P R 312. Practical applications of public relations techniques with emphasis on writing and media usage. Field and laboratory practice.</td>
</tr>
<tr>
<td>413</td>
<td>Public Relations Management 3</td>
<td>Prereq P R 312. Principles and functions of public relations administration. Credit not granted for both P R 413 and 513.</td>
</tr>
<tr>
<td>513</td>
<td>Public Relations Management 3</td>
<td>Graduate level counterpart of P R 413; additional requirements. Credit not granted for both P R 413 and 513.</td>
</tr>
<tr>
<td>496</td>
<td>Cooperative Education Internship V 2-12</td>
<td>May be repeated for credit; cumulative maximum 12 hours. Off-campus Cooperative Education Internship with business, industry, or government unit coordinated through the Professional Experience Program. S, F grading.</td>
</tr>
<tr>
<td>498</td>
<td>Internship in Business V 2-15</td>
<td>May be repeated for credit; cumulative maximum 15 hours. By interview only. Internship with a business organization in professional and managerial activities. S, F grading.</td>
</tr>
<tr>
<td>596</td>
<td>Doctoral Topics 3</td>
<td>May be repeated for credit; cumulative maximum 15 hours.</td>
</tr>
</tbody>
</table>
working with people with disabilities. Cooperative course taught at the University of Idaho (Rec ID441).

PHYSICAL EDUCATION AND RECREATION FOR SEVERELY HANDICAPPED 3 Prereq RLS 110 Characteristics of individuals with severe handicaps; problems encountered in physical education classes and recreational activities. Cooperative course taught at the University of Idaho (Rec ID467).

ELEMENTARY PHYSICAL EDUCATION K-8 2 (1-3) Same as PEP 473.

PRINCIPLES OF MOVEMENT FOR INDIVIDUALS WITH DISABILITIES 3 Same as PEP 484.

INSTRUCTIONAL PRACTICUM V 1-4 May be repeated for credit; cumulative maximum 6 hours. Same as PEP 490.

CURRENT TRENDS IN LEISURE SERVICES 1 Historical development and possible outcomes of current trends and issues in leisure services.

SPECIAL PROJECTS OR INDEPENDENT STUDY Variable credit S, F grading.

MASTER'S RESEARCH, THESIS, AND/OR EXAMINATION Variable credit S, F grading.

MASTER'S SPECIAL PROBLEMS, DIRECTED STUDY, AND/OR EXAMINATION Variable credit S, F grading.

Regional Planning

HUMAN ISSUES IN INTERNATIONAL DEVELOPMENT 3 Same as Anth 418. Credit not granted for both R P 418 and 518.

ENVIRONMENTAL IMPACT STATEMENT ASSESSMENT 3 (2-3) Same as Env S 444. Credit not granted for both R P 444 and 544.

ADVANCED TOPICS IN TRANSPORTATION ENGINEERING V 2-4 May be repeated for credit; cumulative maximum 9 hours. Same as CE 501.

HUMAN ISSUES IN INTERNATIONAL DEVELOPMENT 3 Same as Anth 518. Graduate level counterpart of R P 418; additional requirements. Credit not granted for both R P 418 and 518.

ENVIRONMENTAL IMPACT STATEMENT ASSESSMENT 3 (2-3) Same as Env S 544. Graduate level counterpart of R P 444; additional requirement.

COMMUNITY AND ECONOMIC DEVELOPMENT 2 Prereq R P 550, 567. Applied community development planning as it affects public and private projects from goal specification to implementation.

ADVANCED REMOTE SENSING 3 (0-6) Same as Soils 574.

GRADUATE INTERNSHIP V 2-5 By interview only. Practical work experience in appropriate agencies; for graduate career students. S, F grading.

COOPERATIVE EDUCATION INTERNSHIP V 2-5 May be repeated for credit; cumulative maximum 5 hours. Practical experience in appropriate agencies; required for graduate students in regional planning.

Russian

MASTERPIECES OF RUSSIAN LITERATURE 3 The masterpieces of the great Russian writers of the 19th and 20th centuries.

Scandinavian - (new prefix, SCAND)

101 (For L-101) FIRST SEMESTER DANISH 4 Introduction to Danish; development of fluency and reading ability through varied materials and practical grammar coverage through written drills. Not open to native speakers.

102 (For L-102) SECOND SEMESTER DANISH 4 Prereq Scand 101. Intermediate Danish; speaking, writing, and understanding Danish in a more advanced level. Not open to native speakers.

350 (Swed 350) SCANDINAVIAN LITERATURE IN ENGLISH 2 May be repeated for credit. Scandinavian literature from Ibsen and Strindberg to the present.

TOPICS IN SCANDINAVIAN STUDIES V 1-3

SPECIAL PROBLEMS V 1-4

May be repeated for credit. S, F grading.

Scandinavian, Minor in (see p. 94)

Social Studies, Teaching Major (see p. 95)

Sociology, Options in (see p. 94)

Soils

WORLD AGRICULTURAL SYSTEMS 3 Same as Agron 360.

SOIL GENESIS, MORPHOLOGY, AND CLASSIFICATION 3 Prereq Soils 201. Soil profiles, soil-forming processes, and soil classification. Field trips required.

HUMUS CHEMISTRY 2 Prereq Soils 421, 431. Formation, chemical properties, and significance of soil organic fraction. (a/y) Cooperative course taught at the University of Idaho (Soils ID527).

SOIL BIOCHEMISTRY 3 (2-3) Prereq Micro 201; BC/BI 364; Soils 421. Enzyme activity; microbial activity/biomass; rhizosphere; carbon, nitrogen, phosphorus, sulfur, and micronutrient cycles. (a/y) Cooperative course taught at the University of Idaho (Soils ID537).

ADVANCED REMOTE SENSING 3 (0-6) Prereq basic remote sensing. Digital image processing systems applied to satellite and other remote sensing systems. (a/y) Joint listing with the University of Idaho (For ID572).

SEMINAR IN REMOTE SENSING 1 Presentation of research results and ideas on subjects relating to remote sensing.

Solls, Minor in (see p. 94)

Speech


Speech Communication

SPEECH COMMUNICATION PRACTICUM V 1-6 May be repeated for credit; cumulative maximum 6 hours. By application only. Prereq SpCom 495. Credit not granted for both SpCom 395 and 495. S, F grading.

Statistics

MATH STATISTICS 3 Prereq Stat 360. Applications of random variables and probability in geologic and engineering studies; regression, regionalized variables, spatial correlation. Cooperative course taught at the University of Idaho (Ap/Sci/GEOID ID428).

Soils

SPECIAL PROBLEMS V 1-4
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisite(s)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>512</td>
<td>ANALYSIS OF VARIANCE OF DESIGNED EXPERIMENTS 3</td>
<td>Prereq Stat 412 or 360. Principles of design with analysis and interpretation of data. Joint listing with the University of Idaho (VetSc ID508).</td>
<td></td>
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<tr>
<td>518</td>
<td>TECHNIQUES IN SAMPLING 3</td>
<td>New Same as QMath 518.</td>
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</tr>
<tr>
<td>519</td>
<td>APPLIED MULTIVARIATE ANALYSIS 3</td>
<td>Same as QMath 519.</td>
<td>Joint listing with the University of Idaho (Stat ID521).</td>
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<tr>
<td>533</td>
<td>THEORY OF LINEAR MODELS 3</td>
<td>Prereq Stat 430 or 443; Math 420. Theoretical basis of linear regression and analysis of variance models; a unified approach based upon the generalized inverse. Cooperative course taught at the University of Idaho (AgSci ID533).</td>
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<tr>
<td>542</td>
<td>APPLIED STOCHASTIC MODELS 3</td>
<td>Same as QMath 542.</td>
<td></td>
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<tr>
<td>553</td>
<td>STATISTICAL ECOLOGY 3</td>
<td>New Prereq Stat 449. Ecological stochastic models, population dynamics and genetics, sampling, spatial analysis, discrete/continuous distributions, birth-death processes, diffusion processes (a'p) Cooperative course taught at the University of Idaho (AgSci/For ID553).</td>
<td></td>
</tr>
<tr>
<td>562</td>
<td>APPLIED MULTIPLE TIME SERIES ANALYSIS 3</td>
<td>Same as QMath 562.</td>
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<tr>
<td>350</td>
<td>Swedish Swed</td>
<td>(see Scandinavian)</td>
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<tr>
<td>350</td>
<td>Theatre Arts and Drama (see Drama)</td>
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<tr>
<td>356</td>
<td>VETERINARY MEDICINE</td>
<td>V M</td>
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<tr>
<td>406</td>
<td>VETERINARY CELL BIOLOGY 10</td>
<td>(2-3) Prereq first year in Vet Med. Principles of veterinary microanatomy and physiology; relations of cell morphology to function.</td>
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<tr>
<td>414</td>
<td>VETERINARY CLINICAL NURSING 3</td>
<td>Same as A S 414.</td>
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<tr>
<td>553</td>
<td>ANESTHESIA CASE MANAGEMENT 4</td>
<td>(1-9) Physiology, pharmacology, and pathophysiology of disease as they affect the clinical practice of anesthesia in animals.</td>
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<tr>
<td>575</td>
<td>FOOD ANIMAL MEDICINE AND SURGERY 4</td>
<td>(0-12) May be repeated for credit; cumulative maximum 8 hours. Prereq 4th year in Vet Med. Clinical experience in diseases of cattle, swine, and sheep; rotation through clinic, ambulatory and swine programs.</td>
<td></td>
</tr>
<tr>
<td>576</td>
<td>FIELD SERVICE AND THERIOGENOLOGY 4</td>
<td>(0-12) May be repeated for credit; cumulative maximum 8 hours. Prereq 4th year in Vet Med. Clinical experience in theriogenology and diseases of horses, cattle, sheep, and swine.</td>
<td></td>
</tr>
<tr>
<td>578</td>
<td>PREVENTIVE MEDICINE 4</td>
<td>(0-12) Prereq 4th year in Vet Med. Preventive medicine and management practices related to control of animal diseases (Caldwell).</td>
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<tr>
<td>579</td>
<td>ADVANCED FOOD ANIMAL MEDICINE 4</td>
<td>(0-12) Prereq 4th year in Vet Med. Advanced instruction in the diagnosis and treatment of food animal diseases; preventive programs for horses and flocks.</td>
<td></td>
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<tr>
<td>436</td>
<td>DISEASES OF COMMERCIAL FOWL 1</td>
<td>(2-3) Prereq V Mic 432; V Pa 446. Diagnosis, control, and treatment of diseases in domestic fowl.</td>
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<tr>
<td>436</td>
<td>DISEASES OF COMMERCIAL FOWL 2</td>
<td>(3-7) Prereq V Mic 432; V Pa 446. Diagnosis, control, and treatment of diseases in domestic fowl.</td>
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<tr>
<td>490</td>
<td>WILDLIFE SCIENCE INTERNSHIP 2</td>
<td>(2-8) Prereq 2-8 hours. A cooperative internship with wildlife agencies, coordinated through the Professional Experience Program. S, F grading.</td>
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<tr>
<td>207</td>
<td>BIOLOGY OF WOMEN 3</td>
<td>Same as Zool 207.</td>
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<tr>
<td>247</td>
<td>INTRODUCTION TO FAMILY STUDIES 3</td>
<td>Same as CFS 247.</td>
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<tr>
<td>316</td>
<td>GENDER AND CULTURE 3</td>
<td>Same as Anth 316.</td>
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<tr>
<td>380</td>
<td>HISTORY OF MEDICINE 3</td>
<td>Same as Hist 380.</td>
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<tr>
<td>135</td>
<td>ANIMAL NATURAL HISTORY 3</td>
<td>Identification, life history, ecology, and behavior of animals commonly found in the Pacific Northwest.</td>
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<tr>
<td>207</td>
<td>BIOLOGY OF WOMEN 3</td>
<td>Body functions; health-care concerns unique to women; biological and evolutionary perspectives on femininity.</td>
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</tr>
<tr>
<td>316</td>
<td>HUMAN EMBRYOLOGY 3</td>
<td>New Prereq Intro general biology. Basic aspects of human development with emphasis on congenital defects.</td>
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<tr>
<td>486</td>
<td>MARINE INVERTEBRATE COMMUNITIES 1</td>
<td>(0-3) Prereq Bio S 104. Field trip to Friday Harbor Laboratory to gain first-hand experience with several marine habitats. Joint course with the University of Idaho (Zool ID486).</td>
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<tr>
<td>591 (531)</td>
<td>TOPICS IN POPULATION BIOLOGY 1</td>
<td>(0-3) May be repeated for credit; cumulative maximum 6 hours. Current topics in ecology, population genetics, evolution and systematics.</td>
<td></td>
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<tr>
<td>592</td>
<td>ADVANCED TOPICS IN CELL BIOLOGY 1</td>
<td>(0-3) May be repeated for credit; cumulative maximum 7 hours. Same as GenCB 592.</td>
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<td></td>
<td>SCHOOL OF MUSIC AND THEATRE ARTS</td>
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<td></td>
<td>The faculties and curricula of the Department of Music, and the Theatre Arts and Drama area (formerly in the Department of Speech) have been joined to form a single unit named the School of Music and Theatre Arts. The realignment includes the following changes:</td>
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<td></td>
<td>(1) Redesignate the undergraduate and graduate sequences in Theatre Arts and Drama within the Department of Speech as undergraduate and graduate majors in Theatre Arts and Drama within the School of Music and Theatre Arts.</td>
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<td>(2) Redesignate existing degrees for students in Theatre Arts and Drama:</td>
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<td></td>
<td>(a) Bachelor of Arts in Speech to Bachelor of Arts in Theatre Arts and Drama.</td>
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<td></td>
<td>(b) Master of Arts in Speech to Master of Arts in Theatre Arts and Drama.</td>
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<td></td>
<td>(3) Transfer the Master of Arts in Teaching degree from Speech to the School of Music and Theatre Arts, and rename the degree Master of Arts in the Teaching of Theatre Arts and Drama.</td>
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<td>CERTIFICATION REQUIREMENTS</td>
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<td></td>
<td>Materials Science and Engineering - Certification Requirements</td>
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<td></td>
<td>Certification into the Bachelor of Science program in Materials Sciences and Engineering is limited to 21 students per entering class. To be eligible for certification, a student must have completed at least the following:</td>
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<td>a. 30 semester hours of graded course work at WSU or the equivalent of 30 semester hours of acceptable transfer credit with an overall g.p.a. of 2.0 or above.</td>
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</table>
b. Math 171 and Math 172 or equivalent.
c. Chem 105 or equivalent.
d. Chem 106 or Phys 201 or equivalent.

Procedures and additional details are available in the Departmental Office.

Mathematics or General Studies - Math Education - Certification Requirements
1. Applications for certification are accepted 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.
2. Applications are evaluated, and certification decided, by a three person faculty committee.
3. Applicants must have at least a 2.00 overall grade point average.
4. The mathematics core consists of Math 171, Math 172, and Math 220. This core (or its equivalent for transfer students) must be completed before application.
5. Students with at least a 2.50 grade point average in the mathematics core are certified automatically. Others are not normally certified.
6. Appeals from certification decisions are considered by the department chair.
7. Students who are denied certification may reapply after completing at least 12 additional semester credits, whereupon decisions are based on grades in mathematics, science, and computer science courses, cumulative grade point average and grade point average in mathematics courses numbered 171 and above, and on at least 200.00 for two consecutive semesters, or who are academically deficient, are subject to decertification.
8. Applications for recertification are handled in the same manner as certification applications for those previously denied.
9. Women and minorities are encouraged to apply. Special consideration will be given to affirmative action candidates.

MINORS

CANADIAN STUDIES, Minor in - 21 hours
(Joint program with the University of Idaho)
Fren 101, 102; Hist 312, 436, 437; Na Am 407; Hist 410; Pol S 380, Eng 495, Geog 365.

LATIN AMERICAN STUDIES, Minor in - 20 hours
The minor in Latin American Studies requires 20 hours, at least 8 of which are upper-division. Eight of the total hours must be in Spanish language courses. Courses may be chosen from: Ag Ec 420; Anth 331, 428; Ch St 110, 272, 340, 348; Econ 470, 472; Hist 230, 231, 331, 430, 432, 433, 434; Pol S 413, 435; Soils/Agronomy/Ag/LA 360; Span 310, 316, 360, 471, 472, 474.

PEACE STUDIES, Minor in - 20 hours
Including Phil 497 Seminar in Peace Studies; at least 4 courses from Group A and at least 2 courses from Group B, with no more than 3 courses from any one discipline.

Group A: Econ 416, 472; For L/Asia 352; Hist/Bl St 313, Hist/Bl St 375, Hist/Bl St 425; Hist 461/Pol S 429; Pol S 423, 427, 435.
Group B: Anth 304, 309; Engl 495; Phi/Asia 315; Phil 445; Pol S 333; Psych 390, 392; Soc 350/W St 384.

PHYSICAL EDUCATION, Minors in
Dance - 16 hrs required in PEP, 2 hrs elective in RLS, PEP, or PEACT.
Health and Wellness - FSHN 130, 133, 190, 217; Psych 363, PEP 384, Hist 361, 363; PEP 372 - 17 hrs; one from Psych 220, 230, or EnV 301.
Physical Activity Programs for Young Children - EdPsych 301 or CFS 240; CFS 342; PEP 199, Ed/Psych 307, PEP 472, RLS 285, Hist 363 - 17-19 hrs.
Sport Management - RLS 276, 290, 375, 421, 475, 481 - 20 hrs.
Aquatics - PEP 312, 395, 396, 397, 398, 400, 402, 403; Hist 363 - 16 hrs.

PSYCHOLOGY, Minor in - 18 hours
The minor in psychology requires 18 hours at least 9 of which must be in upper-division courses. Psych 105 or 106, Psych 312 are required; electives must be chosen in consultation with a psychology advisor.

RANGE MANAGEMENT, Minor in - 18 hours
The minor in Range Management requires 18 hours from FRM 301, 302, or Bio S 372, FRM 351, 354, 451, or 452, Soils 501, FRM 450, or 452.

SCANDINAVIAN STUDIES, Minor in - 20 hours
Scand 101, 102, 300, 350, 400, 499; Hist 348; Soc 391. Students may apply up to 10 hours of approved Study Abroad course work toward the minor.

SOILS, Minor in - 16 hours
A minor in soil science may be obtained by students from other departments. Sixteen semester hours in soils is required, at least 8 of which must be in upper-division courses.

OPTIONS IN SOCIOLOGY

PERSONNEL AND HUMAN RELATIONS - REQUIRED
Recommended: Soc 270, 351, 355, 365, 396, 371, 373, 381, 384, 446.


SWEETWATER and Public Policy

HISTORY

Schedule of Studies - History Major
36 semester hours history courses including at least 6 hrs U.S. History, 6 hrs European history, and 6 hrs history from other areas;
12 hours 100-200-level Hist;
3 hrs additional hours Hist;
21 hrs 300-400-level Hist including 3 hrs of Hist 469;
12 hour concentration (at least 6 upper-division) in the same or in related disciplines with the advisor's approval.

Schedule of Studies - History-Education Major
36 semester hours Hist including at least 8 hrs U.S. history, 6 hrs European history, and 6 hrs history from other areas;
Hist 101, 102, 110, 111, and one 200-level survey course;
21 hrs 300-400-level Hist including 3 hrs of Hist 469 plus Hist 422;
3 hrs CAP or W St from: APAS 101, 201; Bi St 101, Ch St 110, Na Am 101, W St 200, or an approved substitute;
Hist 480, a related teaching minor; a non-related teaching minor; requirements from the College of Education.

MAJORS IN PHYSICAL EDUCATION

ATHLETIC TRAINING

Freshman Year
First Semester Hours
PEP 198 1
PEP 262 3
PEP 296/297 1
Psych 185/Engl 101 6
or Bio S 102/Syncr 102 7
PEACT 112 12
Activity Courses** 2
Elective 0-1

SPRING 1989

94
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<th>Second Semester</th>
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<tr>
<td>PEP 199</td>
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<tr>
<td>PEP 256</td>
<td>2</td>
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<tr>
<td>PEP 256/297</td>
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<tr>
<td>Psych 105/Engl 101</td>
<td>6</td>
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<td>or</td>
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<td>Blo S 102/SpCom 102</td>
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<tr>
<td>H Ed 363</td>
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<td>2 Activity Courses**</td>
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<td>PEP 311</td>
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<td>PEP 315</td>
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<td>PEP 391</td>
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<td>Phar 217</td>
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<td>2 Activity Courses**</td>
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<td>GURs</td>
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<tr>
<td>PEP 361</td>
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<td>PEP 362</td>
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<td>PEP 391</td>
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<td>FSHN 130</td>
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<td>2 Activity Courses**</td>
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<td>PEP 466</td>
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<tr>
<td>PEP 391</td>
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<tr>
<td>PEP 364</td>
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<tr>
<td>Zool 251</td>
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<tr>
<td>H Ed 361</td>
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<tr>
<td>GURs</td>
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<table>
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<tr>
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<tbody>
<tr>
<td>PEP 466</td>
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<td>PEP 391</td>
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<td>PEP 363</td>
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<tr>
<th>Senior Year</th>
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<td>PEP 484</td>
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<td>PEP 466</td>
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<td>PEP 499</td>
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<td>PEP 463</td>
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<td>Zool 315</td>
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<tr>
<td>PEP 466</td>
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<td>PEP 499</td>
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<td>Zool 499</td>
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<td>Elective</td>
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**3 hours from the following: PEP 231, 232, 233, 234, 235, 236, 237, 238, PEACT 288

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<tr>
<th>EXERCISE STUDIES</th>
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<tbody>
<tr>
<td>Physical Education Core - 10 hours</td>
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<tr>
<td>RLS 276, PEP 199, 234 or 235, 231 or 237, 228, PEP 238 or PEACT 154, PEACT 140 or 110.</td>
</tr>
<tr>
<td>Physical Education Theory - 16 hours</td>
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<tr>
<td>Exercise Science - 40 hours</td>
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**Recommended Electives - 19 hours |
| Cpt S 133, Math 107, Blo S 102, Chem 102, Mktg 360, Mgt 301. **

**GENERAL PHYSICAL EDUCATION **

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Hours</th>
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<tr>
<td>First Semester</td>
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<tr>
<td>PEP 199</td>
<td>3</td>
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<tr>
<td>PEP 230 series</td>
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<td>GURs (inc. Psych 105/Engl 101)</td>
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<tr>
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<tbody>
<tr>
<td>PEP 230 series</td>
<td>3</td>
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<tr>
<td>GURs (inc. Spe 102/Intercultural)</td>
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<thead>
<tr>
<th>Sophomore Year</th>
<th>Hours</th>
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<tbody>
<tr>
<td>First Semester</td>
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<tr>
<td>PEP 362</td>
<td>3</td>
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<tr>
<td>PEP 296/297</td>
<td>2</td>
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<tr>
<td>PEP 313 or 489</td>
<td>3</td>
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<tr>
<td>PEP 282</td>
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<tr>
<td>GURs</td>
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<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Zool 251</td>
<td>4</td>
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<tr>
<td>PEP 361</td>
<td>3</td>
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<tr>
<td>PEP 364</td>
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<tr>
<td>PEP 315</td>
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<td>GURs</td>
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<table>
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<tr>
<th>Junior Year</th>
<th>Hours</th>
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<tbody>
<tr>
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</tr>
<tr>
<td>PEP 363</td>
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</tr>
<tr>
<td>PEP 473</td>
<td>2</td>
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<tr>
<td>E/Se 303</td>
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</tr>
<tr>
<td>PEP 317</td>
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</tr>
<tr>
<td>EdPay 402</td>
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<tr>
<td>CoPay 358</td>
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<tr>
<td>Minor Core Requirement</td>
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<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>E/Se 405/406</td>
<td>20</td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>E/Se 405</td>
<td>10</td>
</tr>
<tr>
<td>E/Se 450</td>
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<tr>
<td>H Ed 480/481</td>
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<table>
<thead>
<tr>
<th>Elementary and Secondary Education — Social Studies Teaching (subject-matter-major)</th>
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<tbody>
<tr>
<td>Freshman Year</td>
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<tr>
<td>First Semester</td>
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<td>PEP 484</td>
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<td>H Ed 363</td>
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<td>H Ed 361</td>
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<tr>
<td>2 courses from Minor core</td>
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<td>Elective</td>
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<tbody>
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<td>Electives</td>
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<tr>
<td>Recommended electives: Phar 217, PEP 311, 314, 476</td>
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**PHYSICAL EDUCATION TEACHING K-12 **

<table>
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<th>Freshman Year</th>
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<tbody>
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<td>First Semester</td>
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<td>PEP 199</td>
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<td>PEP 230 series</td>
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<td>GURs (inc. Psych 105/Engl 101)</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
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</thead>
<tbody>
<tr>
<td>PEP 230 series</td>
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<td>GURs (inc. Spe 102/Intercultural)</td>
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<table>
<thead>
<tr>
<th>Sophomore Year</th>
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<td>PEP 230 series</td>
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<td>PEP 313</td>
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<td>PEP 262</td>
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<td>GURs</td>
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<tr>
<td>Minor Core Requirement</td>
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<td>H Ed 480</td>
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<tr>
<td>E/Se 403</td>
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<thead>
<tr>
<th>Spring 1989</th>
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<tbody>
<tr>
<td>College of Education requirements</td>
<td></td>
</tr>
<tr>
<td>18 hour teaching minor (English or Foreign Language suggested)</td>
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</table>
COURSES THAT MEET GENERAL UNIVERSITY REQUIREMENTS FOR GRADUATION

H ARTS AND HUMANITIES
ANTHROPOLOGY
ARCHITECTURE
ASIA
ASIAN/PACIFIC AMERICAN STUDIES
COMMUNICATIONS
DRAMA
ENGLISH

FINE ARTS
FOREIGN LANGUAGES
CLASSICS
FRENCH
GERMAN
RUSSIAN
HISTORY

HUMANITIES
INTERIOR DESIGN
LANDSCAPE ARCHITECTURE
MUSIC
NATIVE AMERICAN STUDIES
PHILOSOPHY

SOCIAL SCIENCES
AGRICULTURAL ECONOMICS
AGRICULTURE AND LIBERAL ARTS
ANTHROPOLOGY
ASIA
ASIAN/PACIFIC AMERICAN STUDIES
BLACK STUDIES
CHICANO STUDIES
ECONOMICS
ENVIRONMENTAL SCIENCE
FOREIGN LANGUAGES
FORESTRY
HISTORY

NATIVE AMERICAN STUDIES
POLITICAL SCIENCE
PSYCHOLOGY
SOCIOLOGY

WOMEN STUDIES

I INTERCULTURAL STUDIES*
ANTHROPOLOGY
ASIA
ASIAN/PACIFIC AMERICAN STUDIES
BLACK STUDIES
CHICANO STUDIES
ENGLISH
FOREIGN LANGUAGES
 RUSSIAN
SPANISH
HISTORY

HUMANITIES
MUSIC
NATIVE AMERICAN STUDIES
PHILOSOPHY

C COMMUNICATION PROFICIENCY
AGRICULTURE/HOME ECONOMICS
HISTORY
PHILOSOPHY
SPEECH COMMUNICATIONS

W WRITTEN COMMUNICATION PROFICIENCY
ENGLISH

B BIOLOGICAL SCIENCES
AGING
ANTHROPOLOGY
BIOLOGICAL SCIENCE
BOTANY
FOOD SCIENCE & HUMAN NUTRITION
GENETICS
MICROBIOLOGY
ZOOLOGY

P PHYSICAL SCIENCES
ASTRONOMY
CHEMISTRY
GEOLOGY
PHYSICAL SCIENCE
PHYSICS

Z SCIENCES
ENVIRONMENTAL SCIENCE
FORESTRY
MATHEMATICS

[L] course includes laboratory work.

[G] course meets GUR in either intercultural studies or humanities.

[K] course meets GUR in either intercultural studies or social sciences.

[U] course meets GUR in either sciences or social sciences.

*INTERCULTURAL STUDIES. Effective with the entering freshman class of Fall 1985, 3 hours of courses designated as meeting the GUR in Intercultural Studies are required for graduation.

In addition to those courses designated above as [I], [G], and [K], the Faculty Senate has established the following alternative to fulfilling the Intercultural Studies General University Requirement:

Students who successfully complete foreign study programs in non-Western cultures under the auspices of the Washington State University Office of International Education, or in institutions approved by the Office of Admissions, will have fulfilled the three-hour GUR requirement in Intercultural Studies.

SPRING 1989